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FACETS OF FJORD ECONOMY: A STUDY IN LIFE ON SOGNE FJORD, NORWAY

W. ELMER EKBLAW
Clark University

Sogne, the longest, most picturesque, and in many ways the most typical of Norwegian fjords, best illustrates some of the distinctive facets of fjord economy: the close dependence of the fjord people upon water—the sea, the glaciers, the mountain streams, the waterfalls; the intimate relation between the cultural attributes of the folk and the forest that surrounds them; and the important rôle the remote alpine pastures of the ice-scarred plateau play in the seasonal regimentation of their activities. Water, forest, and mountain pasture—these constitute the three elements dominant in Norwegian fjord economy.

PHYSICAL CHARACTERISTICS

Sogne Fjord practically bisects the highest portion of the southern, and widest, extension of the Norwegian uplands, for it lies between the rugged plateau of Jotunheim with its great Jostedal's brae, or icefield, northward, and the glacier-crowned heights of Hardanger Fjeld southward. From its outlet upon the Atlantic it penetrates wellnigh due eastward almost 100 miles into the massif it divides, terminating at the little hamlet of Aardal on the innermost recess of the Fjord.

Almost a score of lesser and greater tributary fjords, some extremely picturesque and interesting, form part of the Sogne Fjord system, an integrated geographic unit. Two major branches, Fjaerland's Fjord and Lyster Fjord, open upon the northern side; and, one, Aurland's Fjord, narrow and canyonlike, opens upon the southern side. Aardal's Fjord constitutes the innermost extension of Sogne Fjord.

The fjord region of Norway is characterized by strong marine regime of climate, with pronounced annual and diurnal uniformity

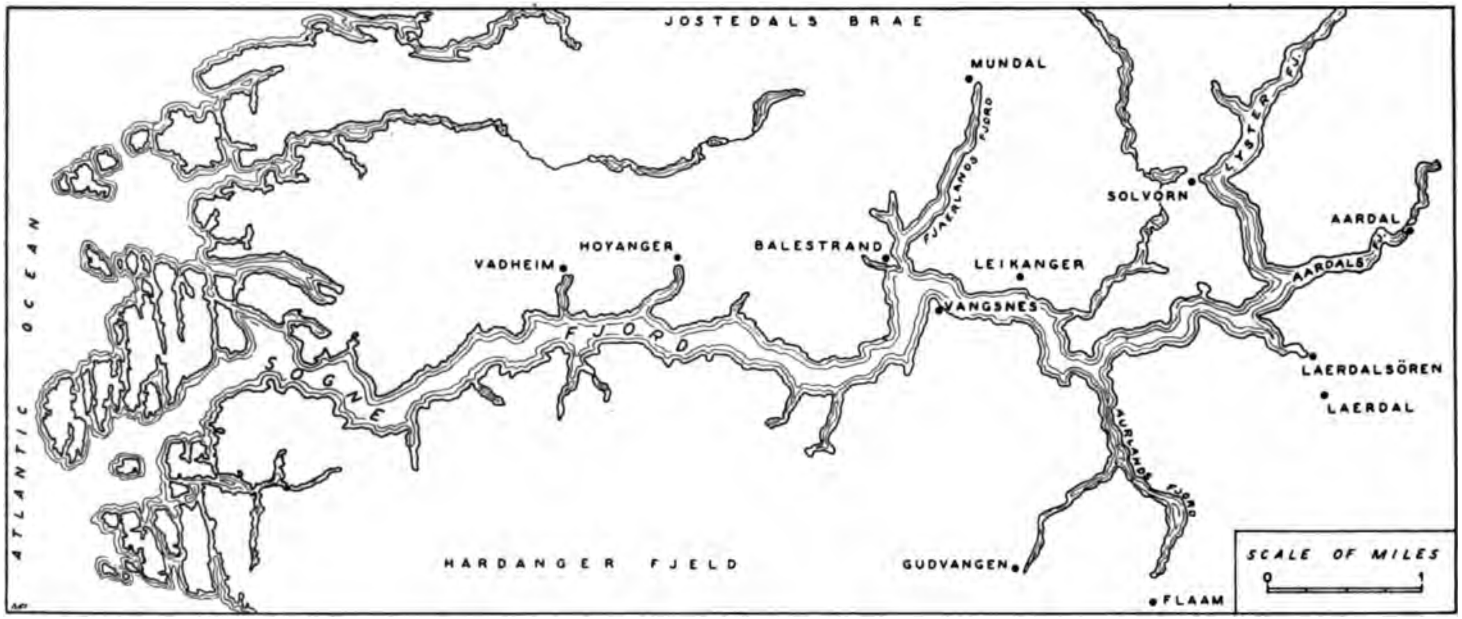

Fig. 1. Sogne Fjord, the longest and most picturesque fjord of the Norwegian coast, penetrates into the plateau more than a hundred miles from its mouth to the little hamlet of Aardal at its head. It has two major fjords opening from the north and one from the south.

of temperature, rainfall, and humidity; and distinguished by abnormally high temperatures and long frost-free growing season with respect to its high latitude; but both uniformity and abnormality diminish as distance from the sea increases, and its influence becomes less effective.

Heavy precipitation uniformly distributed thruout the year and exceeding twelve inches every season, and four inches every month except April, insures copious rainfall during the warmer months of the year and heavy snow cover most of the colder months. The annual precipitation at the mouth of Sogne Fjord averages 80 inches, and at Laerdalsören, eighty-seven miles from the coast, only 16 inches. Similarly, the uplands about the head of the Fjord have notably higher temperatures in summer and lower temperatures in winter than have the skerries about its mouth. The mouth of Sogne Fjord rarely has temperatures below freezing, whereas at the inner end of the Fjord at Aardal the January isotherm of 21°F. indicates rather continuous winter subfreezing temperatures. In July the mouth of the Fjord lies on the isotherm 57°F. average July temperature, whereas Aardal's Fjord lies on the isotherm 61°F., an average of four degrees higher average summer temperature at the head of the Fjord than at the mouth.

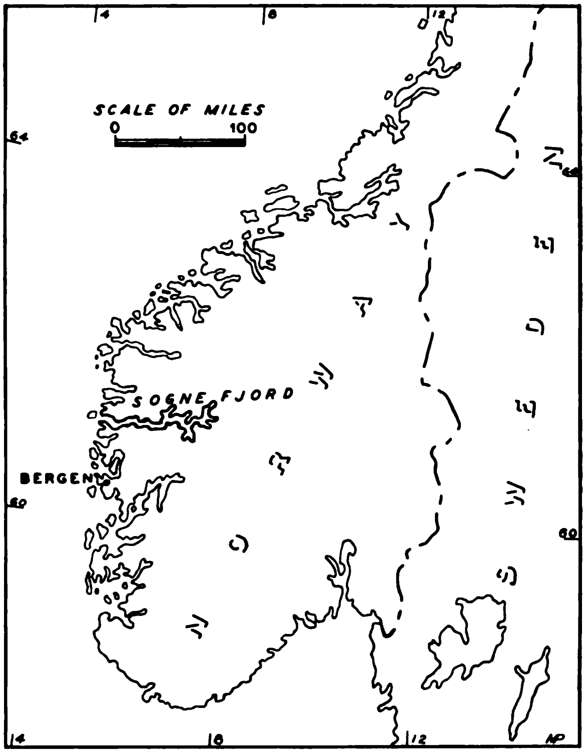

FIG. 2. Sogne Fjord is located across the middle of the widest and highest part of Norway. It can be easily visited from Bergen, which lies only a few miles south of its mouth.

More than 200 days of every year are rainy and snowy at the mouth of the Fjord, whereas at the head of the Fjord at Aardal the number is less than 150, of which just about half are snowy. The first snow falls in late September or early October at the head of the Fjord, generally several weeks later at the mouth; similarly, rain falls at the mouth of the Fjord earlier in spring and the winter snow melts earliest there. The heaviest snowfall appears on the walls of the fjords several hundred meters above sea-level, just where the snow-free period is longest.

More than 200 days are foggy at the mouth of the Fjord, not many more than a hundred at Aardal, its head. Only about thirty days of the year are quite free from fog at the mouth of the Fjord; more than twice as many at the head.

With such wide diversity of terrain within relatively short distances, the climate of the whole fjord region shows numerous variations, and extreme localization of characteristics. The differences between the mouth and the head of Sogne Fjord are probably greater than in any other fjord, because of its greater length; between the main fjord, which lies approximately parallel to the prevailing drift of the air and open to the Atlantic, and the branch fjords, which extend transversely across the path of air movement, the differences are just as great or even greater. Yet in its entirety, the fjord region is characterized by fairly heavy rainfall and uniform temperatures, abnormally higher in winter than their latitude would indicate. The benign influence of the Gulf Drift reveals itself most in the abnormal seasonal temperatures and humidity.

In a region of such rugged and high relief the effect of steep slopes, high gradients of streams, and rocky terrain is pronounced. Drainage in the fjord region is uniformly adequate; soil is thin and widely scattered; water supply is abundant. Transportation and communication by land are difficult and hazardous. Arable land is exceedingly rare.

THE RÔLE OF WATER

Water plays the most important part in fjord life and economy. Everywhere it dominates the thought, the speech, the habits, of the fjord folk. Their whole history is enwrapped in their varied fabric of sea-associations, sea contact. From babyhood to old age they live in intimate relation with the sea, the rushing streams that mark their every hamlet and homestead, the turbulent cascades and cataracts that break the solitude of rocky cliffs with sound of thunder as their torrents plunge over the edge of the plateau to the sea or the rocks below. They think of life and living in terms of water, as they have thought thru centuries.

The smaller branches of the fjords constituted the first units of Norwegian tribal society, each more or less self-contained and independent. In time they associated to form the greater units embracing the main fjords and all their branches. And finally the various fjord peoples were drawn together by their common heritage of sea-intimacy, their common interests in sea-harvests, to combine in the great piratical expeditions of the Vikings, to join in the Hanseatic League, to have a part in emigration and colonization, first upon the conquered shores of Britain, Ireland, Normandy, Iceland, and elsewhere in Europe, and then in the remote lands of the Americas and the antipodes.

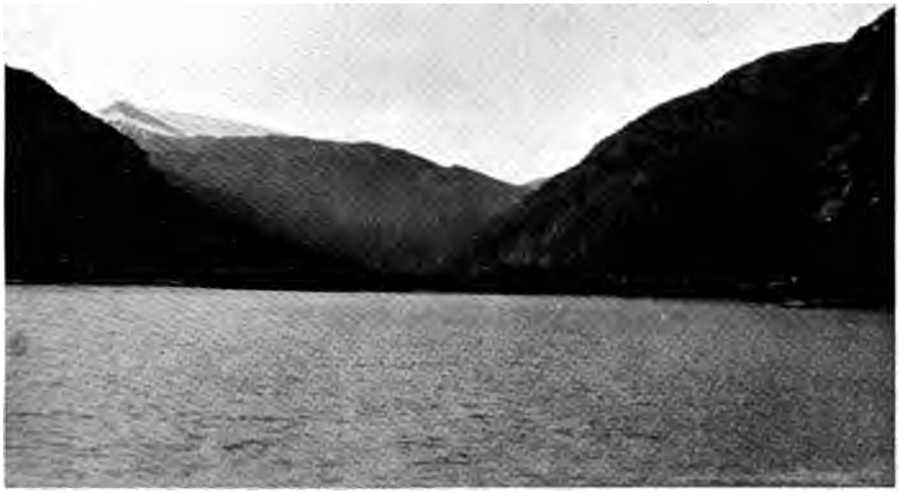

FIG. 3. The head of Fjaerland's Fjord, one of the northern tributaries of Sogne, where the peaceful little hamlet of Mundal occupies the delta built up at the mouth of the little stream flowing from the melting banks of the great glacier, Jostedal's brae, just visible to the right above the spurs of the valley forelands. The photograph was taken at midnight, June 13, 1930.

The home life of every fjord family is regulated by its intimacy with water. Never is there any serious concern for an ample supply of pure, wholesome drinking water—an abundance is ever at hand in the multitude of streams that the trust-worthy rainfall produces, or that issue from snow and icefield on the heights, or from cleanly alpine pasture. The same abundance of water is at hand for personal cleanliness, for laundry, for every necessity of home cooking and home cleaning. The fjord home, and all its equipment, and similarly the mountain saeter and all its dairy implements, are spotlessly immaculate. Almost every fjord home creamery, or milk-house, stands astride a purling brook, of which the cooling current pours around the jars and bowls of milk and cream and butter.

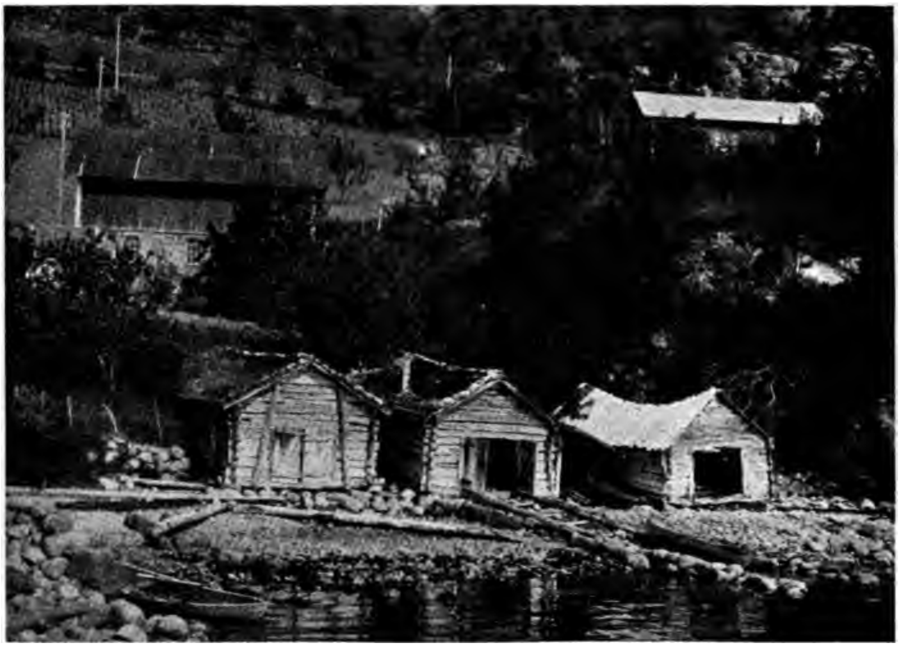

FIG. 4. A group of three typical Sogne Fjord boathouses, built of pine logs from the forest back of the farmsteads, which shelter the rowboats for three families living at the croft. It is by rowboat that the fjord folk move from place to place, keep in touch with their neighbors and get to and from school, church, and market. The rowboat is to the fjord family what the automobile is to the American.

The larger streams have long been employed for domestic or village power, to supply the sawmills which until recently were almost all operated by direct water power. Because the streams are of such adequate volume and strength of current, many of the waterwheels were undershot, despite the ease with which the steep gradients could be controlled to turn breast wheels, or overshot wheels. Adequacy and uniformity of volume and velocity made the undershot wheel in most cases the easier and more economical to construct and operate. On every stream where expediency in the handling and marketing of processed lumber decreed, a sawmill was set up. In recent decades great hydroelectric installations, which utilize the enormous power available from the major streams with their steep gradients and abundant volume, supply electric power so sufficiently, easily, and cheaply that many of the small local water power sawmills have been converted into establishments using electricity.

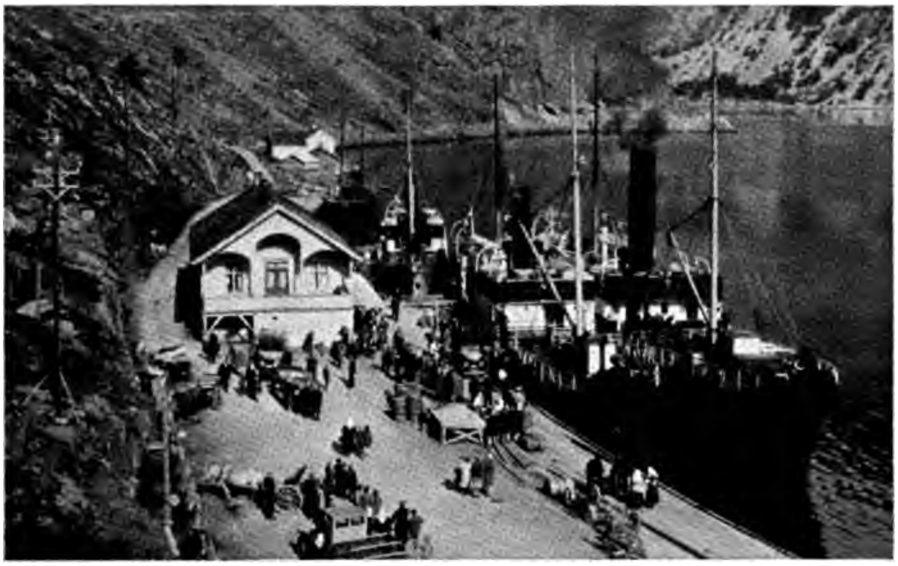

FIG. 5. Every village, every hamlet, almost every farmstead has its wharf or landing-place where the steamers that ply regularly the length of Sogne Fjord and its branches stop to take on milk, or cattle, or timber, or homecrafts, and to discharge parcels of merchandise from all continents. The docks are the meeting places for the fjord folk; there they assemble to watch the ship come in, learn the world's news, and to greet the tourist or returning traveler or emigrant.

The hydroelectric installations along Sogne Fjord have appreciably transformed the economy of the districts accessible to them wherever a processing plant using the power has created demand for labor. The nitrate plant at Vadheim, operated for the British government and said to be controlled and owned by that government, employs a goodly number of Norwegian operatives who form a settlement of considerable size nearby. The aluminum factory at Hoyanger, a subsidiary to a great American company, employs a large proportion of Norwegian laborers and skilled foremen and supervisors. It is run upon American capital under franchise from the Norwegian government, is operated by Norwegian skill and labor, and uses bauxite from North Africa, as its raw material. The residences of the operatives form a small city of modern, comfortable homes. The Norwegian government, which derives no mean income from royalties and franchises granted the manufacturing companies, has safeguarded discreetly, in the regulations prescribed for the utilization of the great stores of water power their fjords develop, the best interests of its fjord folk. Fjord water power constitutes an asset of the first magnitude, an asset in which the whole Norwegian nation has a stake.

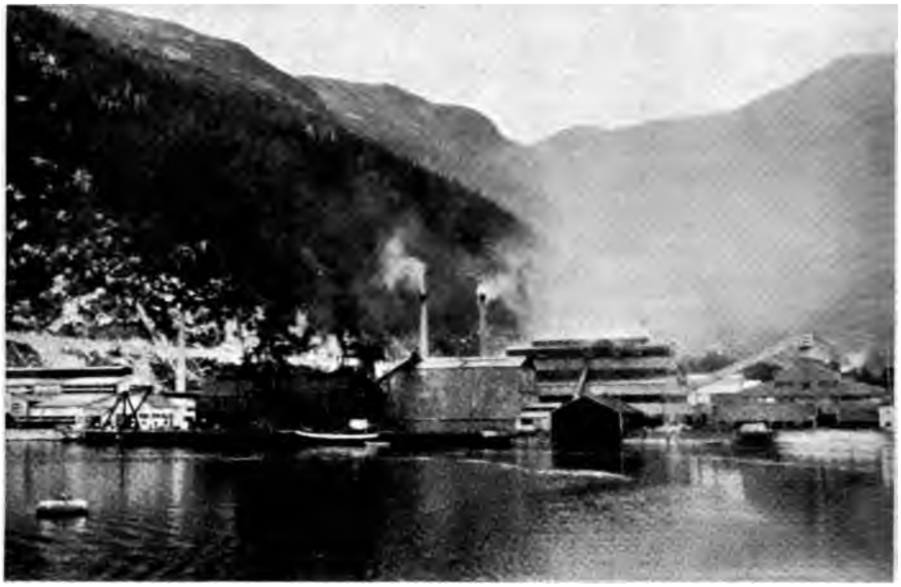

FIG. 6. The huge establishment of the American-financed and American-controlled aluminum factory at Hoyanger, under franchise from the Norwegian government which collects a reasonable royalty, and regulates the relations between the company and its employes and prescribes the conditions under which the mill may operate. The plant affords steady employment and high wages to many fjord workmen. It uses bauxite from northern Africa as its raw material, and employs hydroelectric power generated locally.

The rugged terrain, mantled by sharp fragments of rock talus from the steep cliffs and clothed with somber stands of pine and spruce forest, have rendered land transport and travel difficult, hazardous, and expensive and have reduced facilities for communication so drastically that the system of highways and trails, and post roads and telephone lines, is not even yet commensurate with the needs of the fjord section. The several communities on the branches of Sogne Fjord have relatively slight communication with one another, or with other fjord communities, by land; so far as land connections are concerned they are still well isolated and still inaccessible.

It is to their water-ways that the fjord folk turn for their travel and communication. By rowboat from homestead to homestead, from homestead and croft to village and back again; and by steamer from village to village, from one branch of the fjord to another, or from fjord to fjord, the folk of the fjords almost invariably travel. Many of the children go to school by rowboat; by rowboat whole families go to church, or to weddings, or to funerals. They do their errands by rowboat, they go to some of their scattered fields or to some of their woodlots by rowboat. They go to the museum, to the fair, to picnics, by steamers that ply almost hourly from point to point; and when they go to Bergen to trade, to start on a journey, or to mingle in the great flow of the world's activities, they go by steamer.

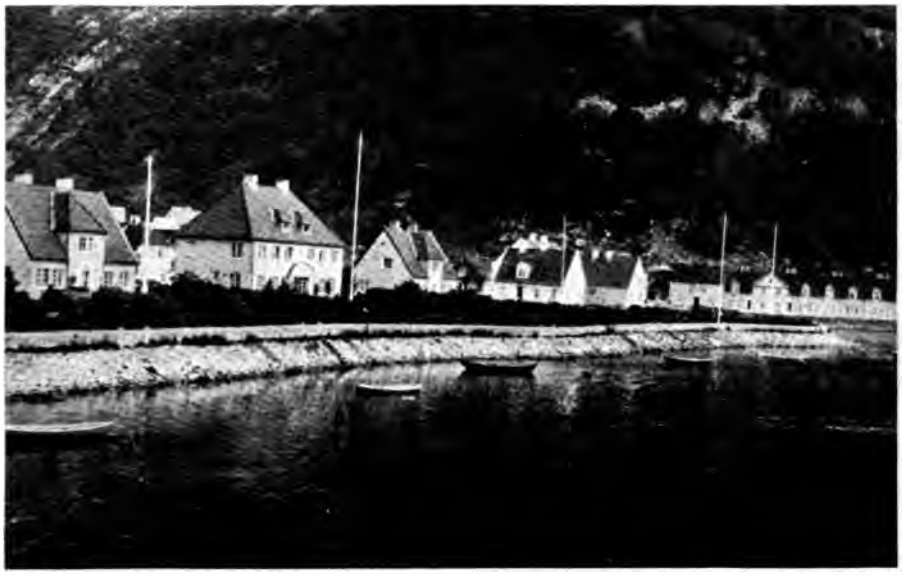

FIG. 7. The residences of the employes of the "American" aluminum plant at Hoyanger, on Sogne Fjord. The modern comfortable cottages, their tastefully landscaped gardens leading down to the water's edge, the boats riding at the foot of the steps from the garden, constitute a commentary upon the economic effect the fjord water power has upon the lives and welfare of the fjord folk. The boats and the flagstaffs represent two attributes of the Norwegians—their love of the sea, and their love of their land.

The rowboat is to the fjord folk what the automobile is to the

American; the steamer is everything that the bus and the train have ever been.

The boathouse, built of logs felled in the winter's snows from forests far up the steep slopes back of the homestead, is the indispensable adjunct to every farmstead, every village household. It opens on one side to the very edge of the water, for the tide is negligible; and on the other side to the pathway from the boathouse to the house—the most footworn of all the homestead's ways. Similarly, the pier or wharf where the steamers dock is the most frequented of all the village congregating places, for there the mail comes in; there the season's surplus of cheese and lumber and handicrafts pile high for shipment to Newcastle or Hamburg or New York; there the tourist and tradesman land and bring new messages, new styles, new philosophies even.

At the docks and wharves all the folk of the village congregate; the men for most of their daily duties; the housewives every moment they can spare from their homes to chat and visit; the old ladies to knit and gossip; the little children to play about the beach, the piles, the edges of the busy landing-places. There they see the wares of the world unloaded in exchange for the wares their fjord distributes to the seven seas; the sailor lads home from their ships; the emigrants to the far corners of the world—from Argentine pampas, from Dakotan prairies, from Rhodesian steppes, from Queensland brush, from Oriental plantations—returning for a visit to the old fjord homestead.

Perhaps most interesting of all are the fishing boats and trawlers as they return with their catch of salmon netted at the outlet of the mountain streams; or of small fry, like herring, to be packed in oil or sauce as sardines; or of some deep water fish from the banks, to be dried, or salted, or otherwise processed and packed. Fishing is the ancient heritage of the fjord folk; niggardliness and poverty of the land have been compensated for by richness of the harvest from the sea—in fish, in whale or seal blubber, in shrimp, and sardine, and cod. They have turned to the sea to fill the larders they could coax the land only partially to fill, and much of their food has ever been, and still is, fish!

Small wonder that the Norwegian is a born sailorman, that the great merchant and passenger ships of the world are manned by Norwegian seamen, that the Norwegian flag flies over Norwegian bottoms in every port and harbor, on every shipping land and trade route that the seas of the world present. Small wonder that the old white-haired grandmother, who knits so complacently by the landing place, can speak with authority of Istanbul, or Singapore, or San Diego, or Sydney—her sons and grandsons bring her gifts and news and pictures from all the great sea-cities of the world. Small wonder that in the schools of Norway, geography holds first place in the curricula—every boy and girl has a cousin, or an uncle, even a brother or sister, almost without exception at least one relative in some distant land, in some remote city. The lines of interest, the lines of contact, are farflung and widespread, cosmopolitan and universal.

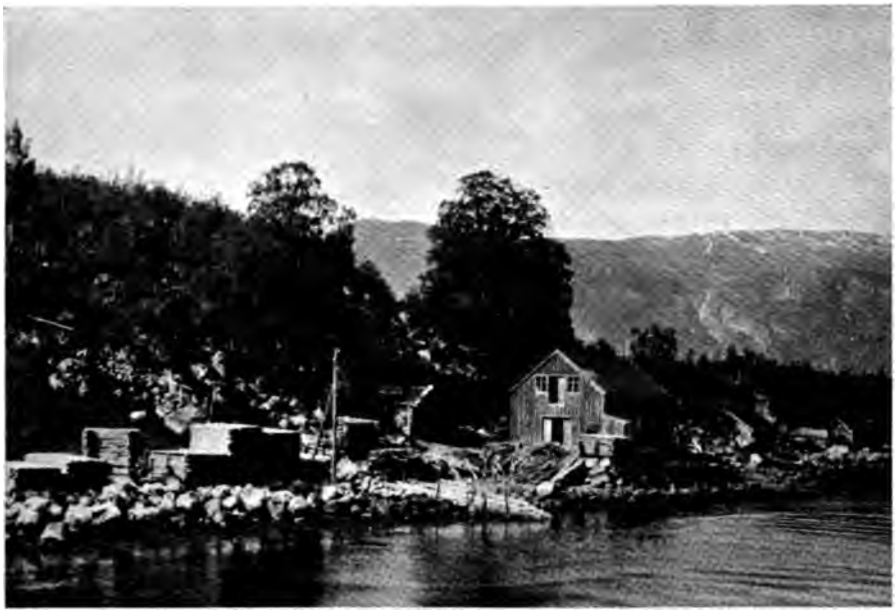

FIG. 8. One of the many modest sawmills that characterize the fjord landscape, operated formerly by direct water power, but now in part by hydroelectric power. Wherever the accessible forest justifies such a sawmill and power is available, one has generally been built. Piles of deal for construction purposes, and of bolts for paper stocks, lie near the water's edge all along the shores of the fjord, particularly in summer and fall, when the logs felled and marketed from the preceding winter's work in the woods have been processed.

It is from the variety and numbers of her sea-interests, her sea-contacts, that she has received her impetus, her incentive, to such heights of cultural attainment, to such leadership in the arts and sciences, in social and political leadership as Norway has displayed in the last half century. Her cultural empire knows no boundaries, her cultural influence no limitations—the seas with which her fjord folk have made her so familiar have washed away all provincialism, all prejudice, all petty constraints of localism. Loving her rugged fjord shores passionately and patriotically, her folk, tho still Norway's children, have become citizens of the world.

THE RÔLE OF THE FOREST

And as the seas have molded the destiny of the fjord folk and the history of Norway, so do the forests enter into their lives. Pine and spruce and birch, rising tier upon tier from the water's edge far up along the rocky slopes, growing luxuriantly in the uniformly mild temperatures and steady rain and snowfall that proximity to the warm sea provide, and supplying the folk with abundance of raw material for lumber and newsprint and homecraft artifact, form the riches of the resources that the fjord section affords.

Careful husbandry, thrifty processing, and scientific management, characterize the woodworking industry of the district. In winter the trees are felled and trimmed, and the logs slid down the chutes along the mountain slopes to the edge of the fjord or the banks of the streams of its tributary valleys, to be rafted to the sawmills and converted into merchantable commodities with the opening of spring.

Along the whole fjord coast, on both sides, almost every hamlet, large or small, boasts its sawmill, operated by hydroelectric power from some plant miles away, or by direct water power from the local stream, where the great resinous boles of the Norway pine, or the long sticks of spruce and fir, are shaped into fragrant deal—ship's timbers, construction lumber, mine props, shingles, boles for newsprint, or the thousand and one wares wrought of wood. Great heaps of sawn timber and paper stock await transport to European or American market. Sawdust is distilled into alcohol or some chemical.

Nothing is left unused. Waste bits of bark and discarded fragments are burned into charcoal. All the gnarly boles, all the small branches and boughs, all the slabs of bark not otherwise utilized are burned in the household stoves, in the great open fireplaces that warm the houses, that cook the food, that bake the bread. Wood is the fuel of the home folk.

Of domestic timber the fjord folk build their homes, their barns, their boathouses, their wharves and docks, their every structure. Of wood they fashion their furniture, their implements, almost their every item of simple home equipment. Of wood they build their churches, their schools, their storehouses. Thruout the whole fjord section, as in all the lands of Fenno-Scandia, wood is the material upon which is based the industrial economy of the people as a whole, and which affords them profitable, income-yielding employment in winter when the stormy seas are least generous and hospitable, the alpine pastures closed to all remunerative labor. The woodlands in winter, the seas and pastures in summer, engage the strength and time and thought of Sogne Fjord's busy folk.

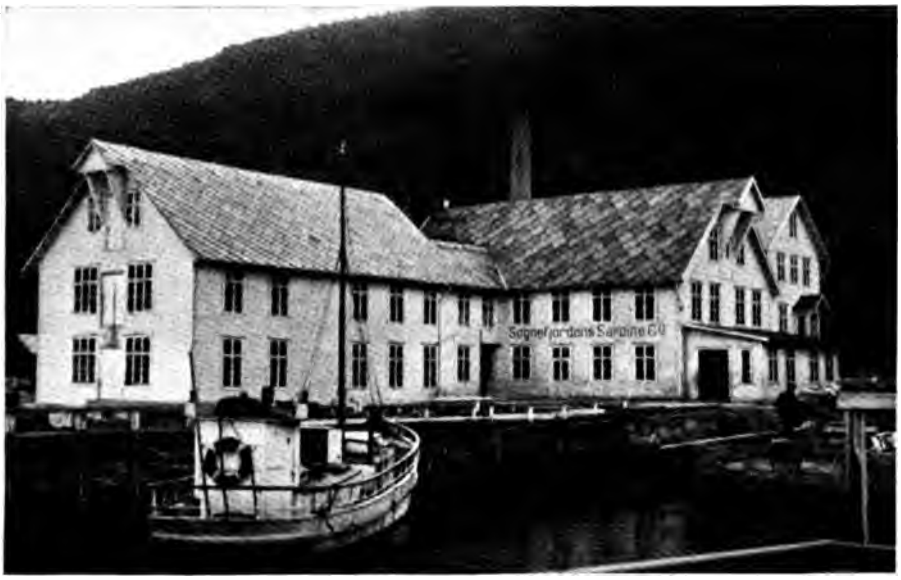

FIG. 9. The sardine packing plant at Leikanger where the fisherman's catch is prepared and packed for shipment. The sea has ever supplied the fjord folk with much of their food and income, and still plays an appreciable rôle in this function. Thousands of cases annually are packed in factories like this.

THE RÔLE OF THE PASTURES

The third major element in the economy of Sogne, as most other fjords, is the alpine pastures used for the summer pasturage of flocks of cattle, and the steep mountain slopes with their groves of stunted aspen, birch, and alder, their wisps of nutritious herbs and grasses for browsing sheep and goats.

The tiny patches of arable ground level enough or with slope gentle enough to cultivate and to hold in grass and crops against erosion, from which stones and stumps have been patiently cleared during the long centuries of human occupancy, are quite incapable of furnishing enough forage, or growing enough provender of any kind, to sustain or support any family and their cattle throughout the year without the supplementary range that the mountain pastures supply. The nutritious grasses and sweet herbage of the uplands and mountain recesses support the cattle during the months when the land is free of snow. Watered with the seep from melting snowdrifts and the downpour of frequent rains, the vegetation of the highlands grows luxuriant enough to pasture, thruout the warmer months, more cattle than the farmsteads can support along the edge of the fjord during the colder months of winter. Transhumance thus becomes one of the features of fjord life, as it is of mountain environment nearly everywhere.

After the long months of winter stall feeding in the farmstead stables along the shores of the fjord, the cattle are first grazed upon the miniature meadows and fields about the family home; but just as soon as the snow on the slopes melts away from patches of grass, and the tender buds and shoots of deciduous leafwoods appear, the cattle are driven up the lower pathways of the neighboring mountains to piedmont pastures where they can readily maintain themselves for several weeks until the snow melts away farther up the mountain walls. The homestead meadows, heavily fertilized by the winter's store of stable manure, are then left to grow grass for the next winter's supply, and the little fields similarly released, are planted to turnips, potatoes, beets or other rootcrops or sown to some of the hardier grains like oats or rye, for supplementary forage.

On Sogne Fjord the first slope pastures utilized lie on the terrace rather indistinctly developed, but none the less significant in the pastoral economy of the region, several hundred feet above the level of the Fjord waters and the farmstead. The while the cattle, sheep, and goats pasture there they are attended by part of the family who stay constantly with them, guide them to the best forage, milk the fresh cows, care for the milk, and between times, cut firewood and gather surplus grass, to send down by cable to the farmstead below. The gleaming wire of the cables shines against the green growth of the hills like a strand of spider web. The line usually extends from the milk-house astride the homestead brook to some convenient ledge on the terrace. Mail, clean clothes, and food are sent up the cable. Fasces of firewood, bundles of hay, and pails of milk are sent down the cable.

By the time the terrace and intermediate slope pastures have been grazed and browsed short, the snow has melted away on the mountain pastures, and the movement upward resumes. For the rest of the summer the flocks of cattle roam the range allotted to each farmstead, thriving and fattening upon the nutritious grasses and herbs, and yielding their largess of milk and cream to churn into butter and curd into cheese. The butter and cheese stored on the heights until the shepherds and milkmaids return to the lowlands when summer has waned and frost and flurries of snow mark the early approach of winter.

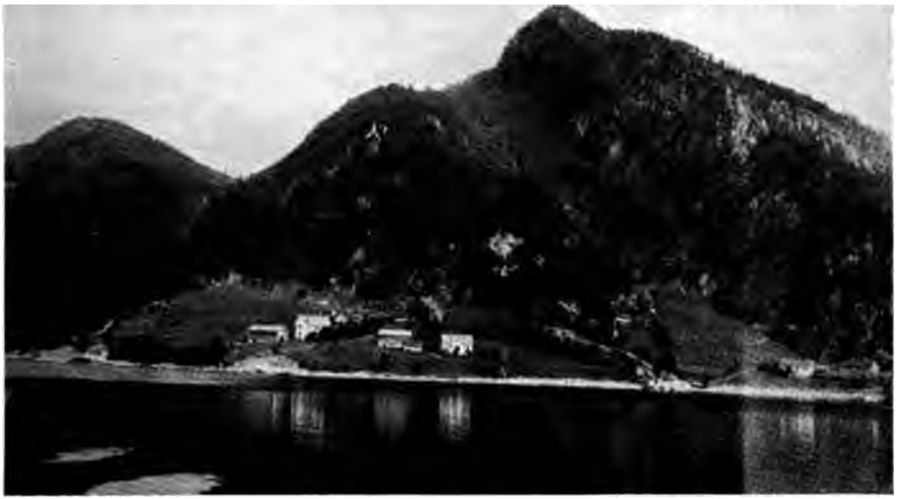

FIG. 10. Three typical farmsteads, with their boathouses, stables, and creameries that constitute a characteristic fjord *"by"* or croft. Nestled at the foot of the rugged inhospitable crags, over which even a footpath is difficult, and dependent upon the tiny plots of cleared soil about them for sustenance, they exemplify the peace, the cleanliness, the courage and strength of the folk who occupy them. The sea is their one vista, their one way of intimacy with the rest of the world.

The little stone or log dwelling in which the members of the family dwell during the season of alpine pasturage is the saeter about which centers so much of the folklore and folksongs, the legal and social regulations, the literature and art of the fjord people. A single saeter with its byres for cattle and its dairy for making and storing butter and cheese, may occupy a smaller of the alpine pastures; where the range is large enough to be shared by several herds and families, several saeters with their out-buildings may constitute a small community. The more persons in the saeter group, the merrier and the more pleasant, as a rule, the summer montane phase of the transhumace.

The milch cows, the heifers, and such cattle as are to be kept over winter, return to the lowland farmsteads and the stables when the mountain pasture season closes, in places and in season rather gradually grazing down the slopes as they go; in other places and other seasons, hastened by inclement weather to an abrupt descent. Some of the calves, and steers, and discarded cattle, fat and in prime condition, are driven down the dales and slopes eastward to markets in Oslo and elsewhere, for sale and slaughter as beef and veal.

Not every part of Sogne Fjord permits local ascent to the mountain pastures; and at such places the cattle are loaded upon the fjord steamers to be taken to other places from which the pastures are accessible and there unloaded. A customary scene at the wharves of some of the way-stations along Sogne Fjord in May, is the unloading from the hold of some of the larger steamers of two or three hundred cattle, collected from the crofts and hamlets on the way, to be sent to mountain pastures for the summer, and in part, to be returned in fall to their owners for winter feeding.

The sheep and goats, tho in some measure similarly moved to mountain browsing grounds, are more closely attached to the home farmsteads. Nimble, and sure of foot, they seek out paths and bits of browse and pasture along the precipitous cliffs, where no man may follow them. Like bits of fleece or cotton they reveal themselves against the rocky walls by a glint of white here, a small avalanche of rock and gravel set in motion there, or the tinkle of a bell upon the lead-wether in another place.

Cheese from goats is one of the staple articles of food and trade from the pastures of Sogne and other fjords, as is milk and cream cheese from cows, golden butter of primest quality, and other processed products from the pastures. In season great quantites of fluid milk are collected by steamer from the many milk stations and collection depots along the Fjord, for delivery to firms in Bergen that process it and distribute the products over the whole world.

Thus are the seas and streams and snowfields, the forests and the mountain pastures, the immaculate farmsteads and orderly villages interwoven into a picturesque pattern of human occupancy, an intricate pattern of fjord economy. The mettle of the folk, the temper of their national character, the quality of their living, their laws, their lore, are written in terms of distinctive fjord features. Their lives are cadenced to the rhythm of the seasons—in snowfield and cataract; in pine growth and fragrant alpine meadow; in sea highways and fishing fleets; in logs, and cattle, and fish, and water power.

PEDALS AND SAILS—THE LOG OF A DIFFERENT SORT OF TRIP TO EUROPE

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Given the privilege of spending our summer vacation in Europe, my brother, who had just graduated from high school, and I, a sophomore in college, decided that our trip was going to be different. The element of uniqueness entered from the start, when we booked passage on a freighter. We felt thoroly familiar with the size and varying moods of the Atlantic by the time we were steaming up the Schelde river to busy Antwerp.

Proceeding by train to The Hague, we were welcomed with all the warmth of Dutch hospitality by Herman, a boy we had known by correspondence for several years. For a month his untiring enthusiasm and energy gave us an introduction to the Dutch people and their country that has grown into a highly valued friendship.

A BOAT TRIP IN NETHERLANDS

We learned that there are two superb ways to explore the Netherlands—by bicycle, and by boat.

The bicycle is ideal, because, in the first place, the country is nowhere very hilly, and distances, as everywhere in western Europe, are not great. In many places, special cycling paths parallel the highways, or find their own way thru the countryside.

With bicycles so common as a means of transportation, one feels immediately at home riding one and not like an outsider straying in.

As for boats, the Netherlands is on intimate terms with water. Rivers and canals make excellent highway systems. The sea is never far away; strong, steady winds fill Dutch sails, besides turning Dutch windmills.

Our Dutch sailing trip came as a complete surprise thru the gracious courtesy of our friend Herman. At the time, we were scarcely aware of how it all happened. Three days after our arrival in The Hague, we were awakened at dawn and hurried to the station on borrowed bicycles. Twenty minutes later, without a word of Dutch at our command, and striving to remember the names of the four young men being presented to us, we found ourselves in Rotterdam.

It was gratifying to discover that they all spoke good English. Just a short walk from the station, and we had reached the water-

NOTE: The European correspondents mentioned in this article were secured thru the opportunities for foreign correspondence offered by "Our Mail Bag" of the *Christian Science Monitor.*

front, and boarded a thirty-foot sloop, belonging to the oldest of our new companions. It was but the work of an instant to cast off the lines, and we were running before wind and tide toward the river's mouth.

That was the beginning of the most glorious week either of us has ever spent. We cruised in leisurely fashion thru the immense bays and estuaries that make Zeeland a province of islands, sometimes sailing straight across an island by canal.

The province is one of picturesque costumes, of immense Flemish horses, of tremendous sea-dykes, of quaint fishing villages—and we saw them all. Our Dutch companions proved to be delightful, all of them alert, active, and warm-hearted. We left them with deep regret when we finally berthed at Rotterdam again.

The provinces of South Holland and North Holland were revealed to us in all their charm and beauty during the subsequent week. We caught a glimpse of a cheese market at Alkmaar, with its centuries-old weighing house, and of cheese carriers wearing broad-brimmed blue hats.

In Alsmeer we were taken to see the up-to-date flower market, where huge rooms are filled with rolling tables piled high with cut flowers. In the auction rooms, the buyers sit in a sort of gallery, while on a large dial before them a pointer rotates to indicate prices on a descending scale. A table of flowers is rolled in, and the pointer begins turning. When it reaches the price the buyer wishes to pay, he presses a button before him, and the number of the first to make a bid is flashed on the dial. Many of the flowers are shipped by airplane to urban centers as distant as Paris.

BY AUTOMOBILE AND BICYCLE

An auto trip with our friend Herman took us north to the great dyke which closes the mouth of the former Zuider Zee, now the Ijsselmeer. The dyke, some twenty miles long, and about a hundred yards wide, is an impressive feat of engineering, with its mighty storm-beaten shoulders, and huge sluice gates.

On our return, we motored across the Wieringermeer Polder, the first of the four polders which are to be reclaimed from the waters of the Zuider Zee. The area is as flat as the plains of Kansas, and sown largely in wheat, with only an occasional village visible. Here and there a rotting ship's hulk in the middle of a field is a reminder that this was once the bottom of the sea.

A week's cycling trip took us thru the central part of Holland to the German frontier, and back, with many pleasant acquaintances along the way, and a greatly increased appreciation of variety in this little country. There really are hills here, quite a contrast with the flat polders of the west; and pine forests that remind us of our own Michigan. We wandered thru one of the great coöperative dairies one day, and witnessed the perfected techniques of wholesale cheese manufacture.

It was on this trip that we became acquainted with the Youth Hostel movement. Our enthusiastic support was immediately attracted by this scheme of providing wholesome and inexpensive lodging for young hikers and cyclists. Its international scope and spirit make it a vital influence in promoting world peace.

One evening in Enschede, near the eastern border, our delightful young hosts gathered a dozen friends from the neighborhood. In a bicycle cavalcade we wandered thru the surrounding countryside, stopping to visit some of the spotlessly clean farm-houses, where the farmers are reputed to be millionaires, and own fine trotting horses, and handsome prize-winning cattle and poultry. From Enschede to The Hague, we decided to try a ''century'' run, and actually made one hundred and forty-three miles in a day's cycling, with bicycles loaded.

IN NORTHERN FRANCE

The second chapter of our trip was devoted to France. A few hours on the train took us from the land of the Nordics to the land of the Romance peoples. Crossing the border at dusk, we joined the mad scramble at the customs station, and did our best to raise our rusty high-school French above the din of a hundred fluent native tongues. We produced every card and ticket we had managed to collect thus far, in our efforts to prove that we were not the advance guard of an invading army. We emerged from the entanglements of red tape just as the train was pulling out, and made a leap for the last car. Soon afterward, we rumbled into Lille, extricated our Dutch bicycles from the baggage car, and pedaled to a hotel.

In the next four days we cycled steadily southward and westward out of the industrial region of Artois, across Picardy's rolling hills, once the scene of a devastating phase of the World War; thru lovely Normandy, with its sturdy half-timbered houses, by way of Rouen, busy port of the Seine, past the Deauville resorts on the Channel, and industrial Caen, to Mont Saint Michel.

As we came over the last rise of the Norman hills, we saw that world famous rock of Mont Saint Michel lying in the distant bay against the sunset. It was unbelievably dream-like. In an hour we had reached and crossed the causeway to the island, and after a superb French dinner, hied ourselves to bed in a little inn on whose site a score of knights must once upon a time have been housed, in days when the island was a ramparted stronghold. The next morning we joined a crowd of French tourists, and wandered thru the fascinating halls and dungeons of the remarkably preserved abbey.

In a few easy days we crossed Brittany, with its gentle hills and pretty hedgerows, and high-wheeled little carts carrying ruddy-faced women to market. Finally we reached Quimper, near the southwestern point of the peninsula. From here we took a little side-trip to Douarnenez, one of the quaint little fishing villages nearby.

Across the bay an emerald hill sloped steeply to the water. Blue nets were drying from the masts of the tiny boats in the harbor, and clusters of fishermen, dressed in faded red dungaree suits, chatted by the quayside. We recalled Loti's story of the "Iceland Fisherman," and asked one of the old men if he had ever been to Iceland to fish. Oh, indeed he had, many a time; but that was years ago. In these days, the steam-powered trawlers of the North monopolize the Great Banks. He was a wizened little fellow, with a cheery face, like his mates on the wharf. The women of the village seemed solemn and stern, probably their heritage from mothers who had watched their men-folk sail away in tiny cockle-shells, ever at the mercy of the great ocean.

In the Chateau Country

From Quimper we journeyed by train into the heart of the Touraine, taking our bicycles as baggage for the insignificant sum of thirteen cents, a rate that we found was good for any railroad trip in France. At Blois, we paid a visit to a French family we had known thru correspondence—one of the few occasions that we were able to visit in a French home. We left most of our baggage at Blois, and spent three days cycling thru the famous chateau country, with its architectural gems nestled in the valley of the Loire.

At the Youth Hostel at Tours we met a group of cycling companions, and passed a fascinating day with them, finding French boys of our own age different in many ways, yet interesting and likeable. One of our discoveries that day was the extent to which French politics permeates even the youth of the country.

ON TO CARCASSONNE

Returning to Blois, we embarked on another train ride, this time south to Bordeaux, and on thru Toulouse to Carcassonne. As we went farther and farther south, the ever-changing "room-mates" in our third-class compartment became more loquacious, and in contrast to the taciturn Frenchman of the North, everyone wanted to know who we were, where we were going, and then, almost invariably, what people really thought of Roosevelt's New Deal.

Carcassonne, with its accurately restored walled city, was well worth the five-hundred mile train ride we had taken to see it. We exhumed our long-forgotten love of fortresses and knights, and roamed among the mighty battlements in childish delight. In the distance lay the great French Massif to the north, and the Pyrenees to the south, and here stood this grim castle in all its rugged grandeur, once the defiant outpost of European civilization. We were carried away with the thrill of it.

ALONG THE RHONE

A pleasant ride down the broad valley brought us to the Mediterranean, blue as the depths of the azure southern sky. The towns were glistening white clusters of houses on vine-covered slopes, and life moved in the gentle tempo of the Mediterranean world. Acre after acre, mile after mile of grapevines unrolled as we cycled on thru Sete and Montpellier, to Nimes. In that city, northern center of Roman glory, we surveyed the mighty arena and crumbling Roman temples. Nearby we stood in awe before the arches of the great Pont du Gard, spanning a wooded valley, built to carry water on its way from the hills to the settlements on the plains. It deepens respect for that race of builders, the Romans, to see these silent monuments to their genius.

At Avignon, historically famous little town with its great Palace of the Popes, we crossed the swift Rhone, and there turned northward into its rich, wide valley. As we rolled along the level highway, we heard a droning overhead, and looked up to see the Graf Zeppelin, symbolic destroyer of distance, nosing its way home to Germany, after one of its regular trips from South America.

AMONG THE FRENCH ALPS

At Valence we resorted to the railroad to take us eastward to Grenoble, nestled in a flat valley surrounded by the massive foothills of the Alps. A day in this cosmopolitan little city, and then on by train into the heart of the mountains themselves. Ever northward and eastward we went, stopping now and then to change to smaller and slower trains, until at last it was the tiny electric train which crept upward into the shadow of that mightiest of Alpine monarchs, Mont Blanc. At a little town, a few miles above Chamonix, we climbed eagerly out to find ourselves greeted by another correspondence friend, a native of the valley and an expert mountaineer.

We spent two glorious days with our host and guide, getting a taste of Alpinism in the mountains surrounding that beautiful spot —days that will live forever in our memories. He wanted us to stay two months, to learn to climb the reputedly difficult "Needles" that tower above the valley. But the third morning, with great reluctance, we mounted our bicycles and rolled down the valley of Chamonix in a drenching rain. The road soon became level. The sun was shining that afternoon when we pedaled into Geneva. Our visit to the mecca of internationalists took us, of course, to the old and new League buildings, the latter, at the time, still not completed, but very grand in its setting above the mountain-rimmed lake.

Seeing Switzerland

To our ultimate delight, we undertook the somewhat doubtful project of invading Switzerland by bicycle. A memorable ride brought us along the beautiful road circling the north shore of Lake Geneva, then up for some eight miles of switchbacks into the "Oberland," over whose pleasantly rolling terrain we cycled for several hours. It was a surprise to find ourselves at nightfall climbing once more, but the night was filled with moonlight; so we went on, walking the last few miles until we reached the top of a high pass, then swiftly down the other side to a tiny mountain inn with huge feather beds.

There were four short but marvelous days with Swiss friends who live just where the undulating northwestern plateau meets the high mountains. We discovered that it is not only the foreigner who makes the Swiss Alps his playground. At the last stroke of noon on Saturday, all the Swiss nation pulls on its hobnailed shoes, packs its rucksack, and heads for its unrivalled "back-yard," the mountains. With borrowed shoes and rucksack we joined the lighthearted throng, and spent Saturday night in the hay-loft of a cattle herder's hut far above timber line, and Sunday amidst the peaks. The ideal "week-end"!

HOME AGAIN

Once more our cycles went aboard the train, this time moving toward Paris. With only four days in the capital, we were kept on the jump getting everything in. It was thrilling, every minute of it, with the stimulating vigor of Paris all about us. But we never regretted having spent the time we did in the French provinces, and obtaining what we felt was an idea of the real France, and not just of its renowned metropolis.

Back thru Belgium we went, with a stop to see the Brussels exposition, in many ways like the Chicago "Century of Progress," yet how different was that staid and undemonstrative old-world crowd! In the Netherlands once more—"home," it seemed—we made a short cruise with our sailing friends into the Ijsselmeer. Then all was over. Our friends came en masse to the dock. The freighter slipped gently toward the sea, and the last farewell was swallowed by the night.

NOTE

The essential expenses of the trip described amounted to about $300.00 for each of us, divided roughly as follows:

Ocean passage	$110.00	Bicycles	40.00
Meals and lodging	100.00	Miscellaneous	15.00
Train fares	35.00		
		Total	$300.00

SAIGON, FRENCH INDO-CHINA

SHANNON MCCUNE
Syracuse University

THE APPROACH TO SAIGON

Coming up the Donai River from the China Sea in the grey light of the dawn we are impressed by the flatness of the landscape, relieved by only a small line of hills in the northeast and seemingly devoid of human occupancy. But as the sun rises and the boat winds its way along the meanders of the river, the first impression is changed, for from the vantage point of the boat deck, comparatively high above the delta, the landscape comes to life. As the light increases, what was seemingly unbroken dense jungle becomes rice fields scattered among the mangrove swamps. Here and there are darker patches marking clusters of houses, the villages from which the inhabitants are beginning to go out to work in their fields. The tributary rivers seem to awaken, also, and serve their double purpose of canals and fishing grounds. In the distance, seemingly a mirage amidst these strange surroundings, gleam the spires and towers of the city of Saigon, "The Pearl of the Far East."

The sky is clear for it is April and the monsoon has not yet started. If we were from two to five months later the monsoon would be here in full force with heavy rainfall. The heat, already oppressive in the early morning, is typical of the temperature which varies only slightly from day to day and from month to month.

As the morning wears on and the boat passes farther into the interior, the scene becomes increasingly animated. The river and the canals teem with life. More land has been cleared from the tropical rain forest and is being used for rice fields. After slowly twisting up the river for 40 miles in a channel only 1,000 feet wide and 33 feet deep, the steamer warps into the Messagarie Maritime docks, a part of the docking facilities which stretch for four miles along the left bank of the river. Most of the tourist passengers have made plans to visit the ruins of the ancient palaces and temples at Angkor in Cambodia, a day's auto drive to the northwest, but to us the major interest is the city of Saigon.

The entrance which we have made is far different from the expedition of the French which in February 17, 1859, made its way up the river and took military control of the region. Two years later

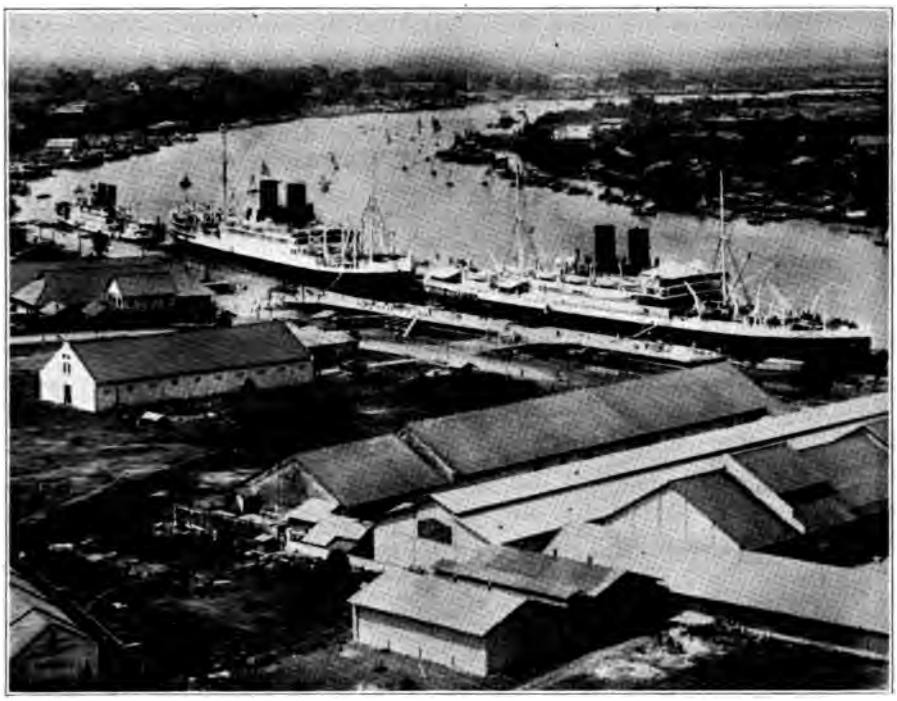

Fig. 1. Looking up the Saigon River, with ocean-going vessels and warehouses in the foreground, and the river winding away to the right on the flat land. To the left lies the city of Saigon, hidden among the foliage of the trees. Courtesy, French Information Center.

Saigon and its immediate hinterland, Cochin-China, were formally ceded to the French by the native ruler. Altho as Prei-Kor ("Forest of Kapok Trees"), Saigon was inhabited in pre-historic ages and became a fortified city under the Khmer kings, it was only a fishing village of small importance at the advent of the French. Now, however, as a French authority says, "Saigon se place en tête de toutes les villes de notre domaine colonial."

THE CITY OF SAIGON

From our vantage point on the deck we can see the river before us with a couple of French cruisers anchored and small native boats going up and down the river or entering the important canal, L'Arroyo Chinois, which is just below us and goes to the west to the Mekong River, via Cholon, the large industrial city bordering Saigon. Up at the bend of the river is a drydock and an arsenal from which floats the tri-color of France. The shores are crowded with small boats from which a constant stream of persons are coming and going to the landing stages and warehouses. Our view of the town is blocked by the trees which were planted by the French when they first came, so that we must go down to the street level to learn more about Saigon.

Our reconnaisance trip thru the streets leaves a different impression than that which an early traveller received in 1872. For example, the trees which he drew as little saplings, protected from roaming animals by wire netting, are now large shade trees, giving Saigon a distinctive peculiarity among the ports of the Far East. The appearance of the Palais du Gouverneur General now in the center of a beautiful park was to him "in the midst of a tropical jungle and surrounded by only a few bamboo huts, most droll."[1]

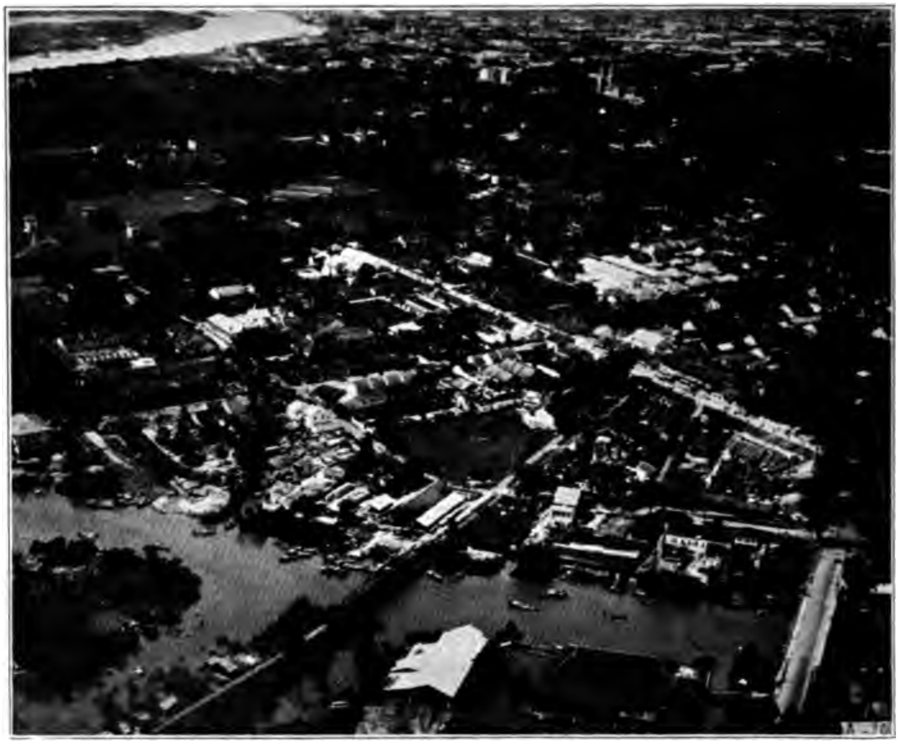

Fig. 2. Panorama of Saigon. In the background to the left is the Saigon River; out from the foliage of the center of the city stand the Cathedral and the Government buildings; in the foreground is one of the tributary canals. Courtesy, French Information Center.

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[1] Frank Vincent, The Land of the White Elephant. New York, 1874.

Now a closer harmony is being struck between the European and the Asiatic influences and Saigon is like a French provincial town transplanted to an Oriental setting. Back from the river and its port facilities are numerous large public buildings, placed along broad tree-lined streets with gardens and parks having exuberant tropical vegetation. Further into the city, there are, in the French style, street cafes, large department stores, office buildings, and above all, dominating the sky line, the red brick Cathedral. In connection with the French town is the better residential district with fine boulevards, bordered by tamarind and teak trees forming a canopy, with villas in the midst of tropical gardens, and with well-groomed parks scattered thru it. Out from this center there is a gradual transition to the native districts with flimsy straw huts crowding closely together and housing the bulk of the population.

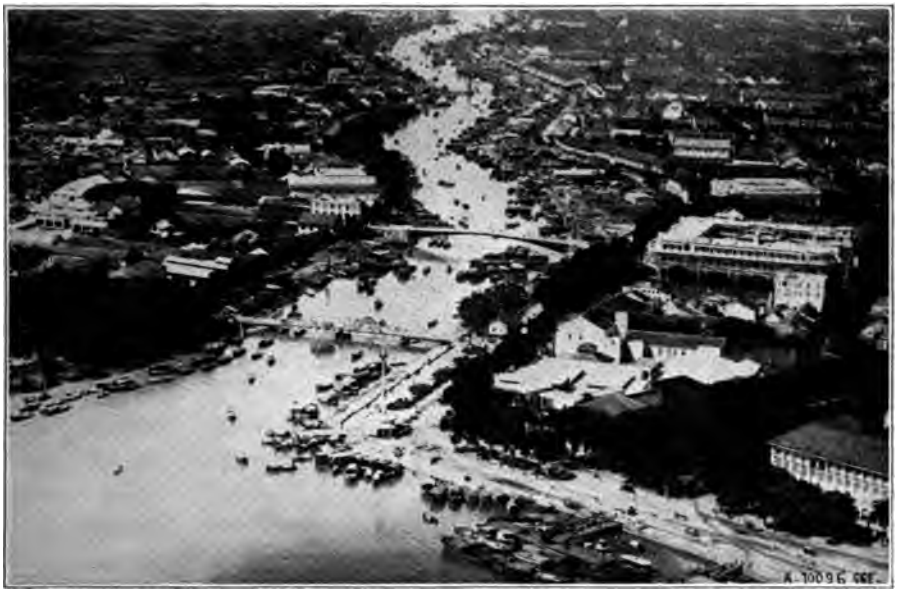

Fig. 3. L'Arroyo Chinois, the canal which branches off from the Saigon River in the foreground and is the main artery of river traffic between Saigon and Cholon. The shores are crowded with small boats carrying commerce to the warehouses along the banks. To the right lies the main part of the city of Saigon. Courtesy, French Information Center.

The streets show this mixture of Europe and the Orient even more plainly for all manner of people can be seen. According to the latest (1931) census, there was a population of 123,298 persons, of whom 11,115 were Europeans. The native people are for the most part Annamites, a race with Chinese culture; in addition there are

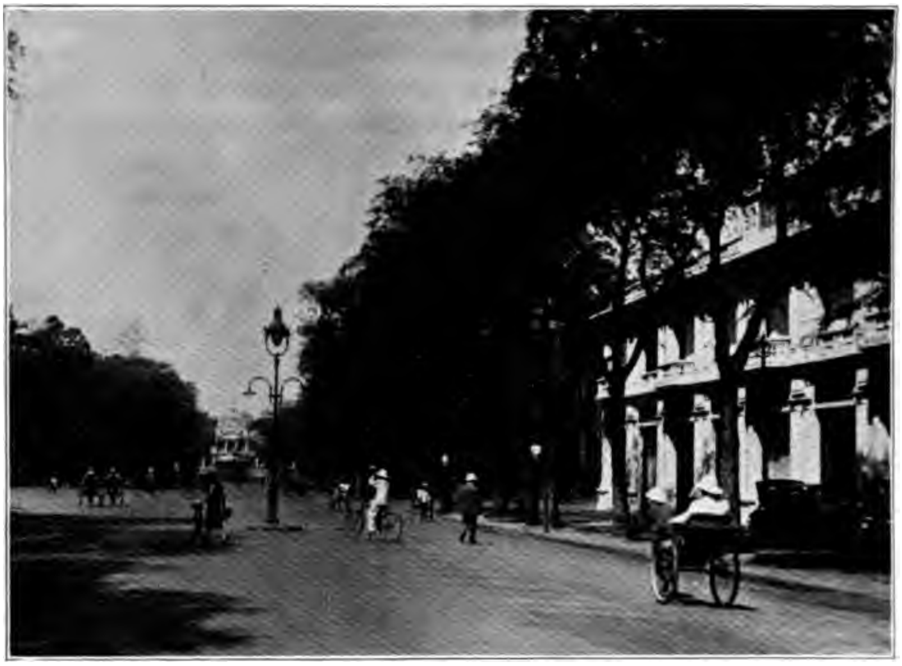

Fig. 4. Le Boulevard Norodom, a typical tree-lined street in Saigon. Courtesy, French Information Center.

some Cambodians, who have an Indian culture. The Europeans keep in close touch with the home land and are engaged in colonial, business, or religious affairs. The Chinese have a definite place in the community, especially in the commercial life, altho most of them live in Cholon. These totally different people mingling in the streets make the city very colorful and present strange contrasts.

THE HINTERLAND OF SAIGON

Its Regions. The importance of Saigon lies not so much in the city, itself, but in the fact that it is the focusing point for a large and productive region which forms its hinterland. Saigon lies on the boundary of two natural regions into which Cochin-China may be divided. To the northeast there is a gradual rise to the Central Indo-China Plateau with ancient alluvial deposits and red earths derived from the alteration of basalts. Here are few wet lands suitable for rice production except in the valleys of the rivers and the land is covered by a vast tropical rain forest inhabited by a few primitive tribes. Some land is being used for rubber production and the forest products are its greatest contributions to Saigon at the present.

The northwest, in contrast, is a country of low relief, formed of recent alluvium and in which water is always present, either from rainfall or from irrigation from the rivers. Here the people are much more densely settled and rice, the fundamental product of the region, can easily be grown. Out of the 2,400,000 tons of rice produced in Cochin-China in 1927, 97 per cent was grown here altho this region contains only 64 per cent of the area.[2] Altho the agricultural land has increased almost four fold since 1883, this area can be made even more productive. The increase in the yield has not been proportionate to the increase in acreage because of insecure economic factors. In 1929, 45 per cent of the rice growing area in Cochin-China was owned by 2½ per cent of the total number of farmers; 42½ per cent of the rice growing area was cultivated by one-fourth of the farmers on farms ranging from 12.4 to 124 acres in size; and the remaining one-eighth of the rice growing area was cultivated by 72½ per cent of the farmers on plots less than 12.4 acres in size. Thus there are many tenant and small farmers on poorer lands who do not take sufficient care of the land or use modern farming methods. The domination of one crop, rice, is another cause of instability in the economic life. This has especially been shown during the last few years when the demand for rice from

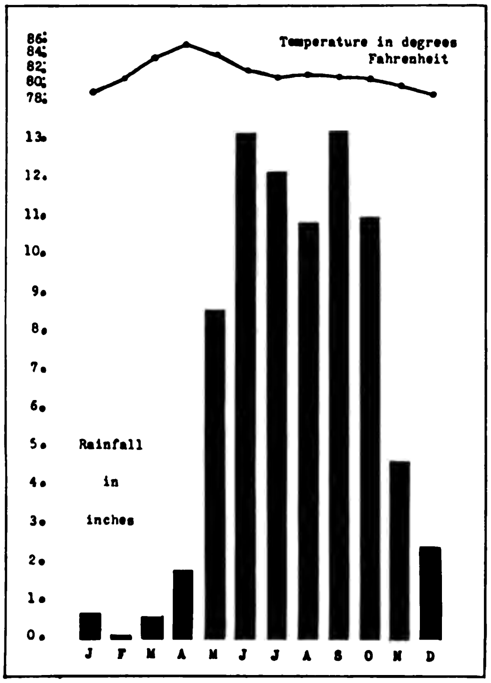

FIG. 5. The climatic data of Saigon, French Indo-China. The city is 36 feet above sea level, in longitude 106° 42′ 4″ and latitude 10° 46′ 47″. From "Annuaire Statistique de L'Indo-Chine," Hanoi, 1934. Average annual rainfall is 78.82 inches and the average annual temperature is 81.68°F.

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[2] P. Gourou, L'Indochine Francaise. Hanoi, 1929.

other nations fell off and caused a serious crisis. The price of rice, computed even in the native currency, in 1929 was three and a half times what it was in 1934. These insecure factors are being corrected by the adoption of better economic practices, such as the diversification of crops and other corrective measures.

Altho it will be the most important crop for many years, rice is not the sole product of the region. Corn and spices, such as pepper, cinnamon, and ginger, are grown, and rubber plantations are being established. Along the waterways and the coast there is much fishing, serving as an additional source of food and income. There is enough tobacco, coffee, and tea grown to supply the needs of the inhabitants.

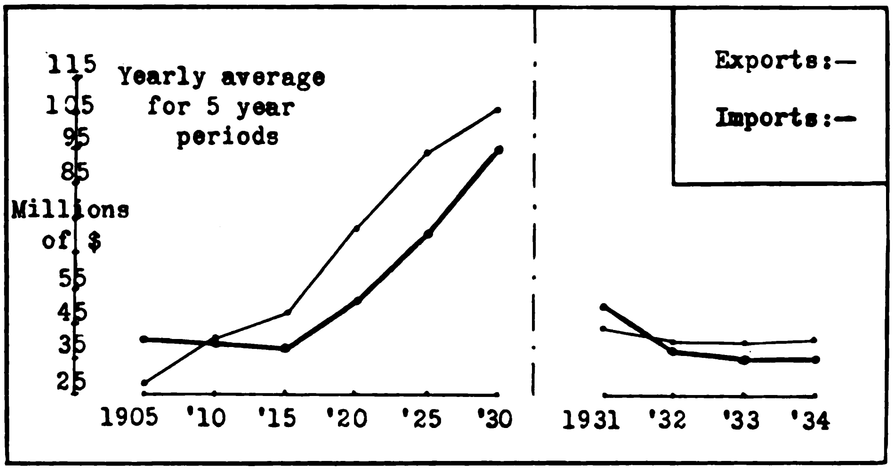

Fig. 6. The total trade of Indo-China thru the years.

In the hinterland, altho not so near or so closely connected to Saigon, is the upper drainage basin of the Mekong River. Here rice is also grown but is mostly consumed by the native population. The Tonlé Sap, a lake along one of the tributaries, is a center of the fisheries, and fish and fish products are exported thru Saigon. Silk of good quality is produced, and cotton and cane sugar are recently introduced crops which are growing in importance.

Its Transportation Facilities. None of this hinterland, however, would have the importance it has for Saigon, if it did not have an excellent system of transportation which knits it together with Saigon as its focus. We have seen that the city is of easy access to the ocean for large vessels, for it is not on the silt-laden Mekong

River but is on the Saigon branch of the Donai River and thus is more easily kept silt-free. It is advantageously located near world trade routes and is only 25 days distant from Marseilles. There is a regular air mail and express service, also. In addition to being the greatest foreign trade port, Saigon is the greatest river port of Indo-China. From it a system of canals, using the natural waterways, for the most part, extends in all directions. There are railroads which when completed will link Saigon with Bangkok and Hanoi, and auto roads extending out from the city, paralleling the railroads and connecting their missing links, and in other directions. However, these roads and railroads, altho faster, do not carry the volume of trade which the waterways bear.

Its Industries. The influence of the hinterland is naturally very great on Saigon. Some industries have developed, such as rice and lumber mills and factories for tobacco, rubber goods, and cement tiles, which reflect this influence. There are also industries occasioned by presence of the city, such as breweries, distilleries, ice manufacturing, silk weaving, jewelry, and trinkets.

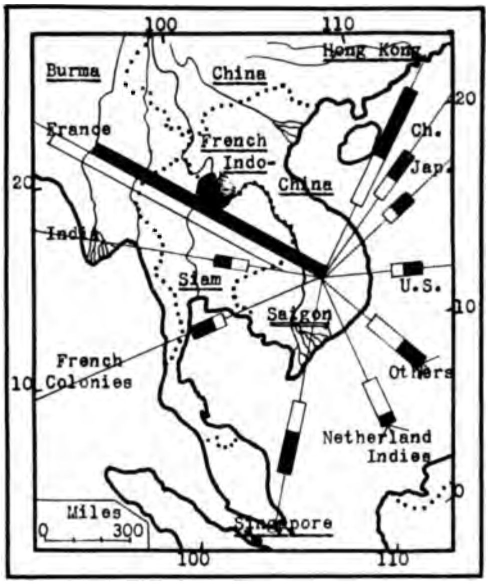

Fig. 7. A map of Indo-China. The place names are underlined. Superimposed is a diagram showing the export trade in solid black, and the import trade, blocked out, of Indo-China with various different countries in 1934.

The industrial center however, is in Cholon, only 9 miles to the west of Saigon and in reality a suburb of it. The city was founded by a Chinese colony in the seventeenth century and in 1931 the Chinese comprised half of the population of 134,060 persons. It is a typical Oriental city with a picturesque confusion of buildings, streets, and canals in striking contrast to its more orderly neighbor. It is very dependent on the hinterland for its raw materials. Rice milling is the principal industry and in 1928 there were 42 establishments capable of treating 2,600,000 tons of rice annually.[2] The city was naturally very hard hit when the rice market collapsed and lost 40,000 Chinese inhabitants in one year.[3] Other industries, such as fish oil extraction, silk weaving, lumber working, and distilling, reflect the importance of the hinterland.

THE TRADE OF SAIGON

By far the greatest importance of Saigon lies in commerce, for it has both an external and an internal trade of great proportions. The city is the most important port of Indo-China, handling three-fifths of the imports and three-fourths of the exports. Figures 5-9 present diagrams (based on statistics in the Foreign Commerce Yearbook, Washington, 1935) showing in a condensed manner the trade of Indo-China thru the years, the commodities which make up the trade, and the countries with which it is carried on. From these a general picture of the trade of Saigon can be drawn, altho the port does not handle some of these products and ships almost the entire trade in certain other products. For example, in 1927, none of the minerals went thru Saigon while 88 per cent of the rice was shipped via Saigon.

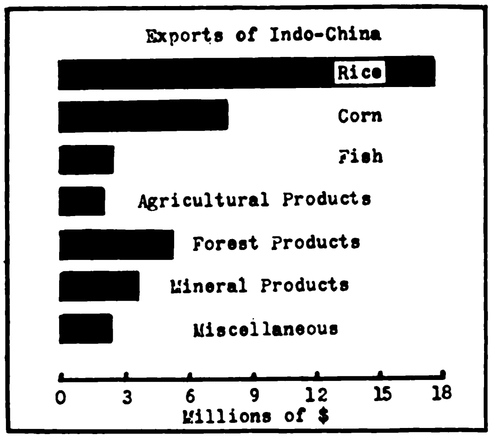

Fig. 8. The commodities exported from Indo-China in 1934.

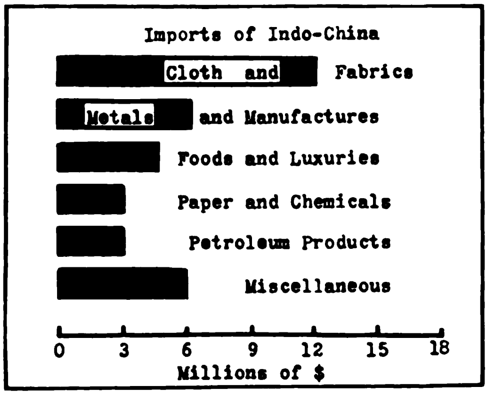

Fig. 9. The commodities imported to Indo-China in 1934.

Of the exports it can be seen that rice is of the greatest importance. Indo-China ranks next to Burma as the world's leading exporter of rice and in 1934, 1,529,504 tons, in 1935, 1,700,879 tons of rice were shipped from Saigon.[4] Other products from the hinterland of Saigon which are exported in appreciable amounts are corn, rubber, fish, spices, and forest products. The imports are materials which are in demand for the large population of the city and hinterland and consist of manufactured and prepared products such as textiles and machines; foods and luxuries for the foreign populations, such as wines, cigarettes, and vermicelli; special manufactures, such as paper and chemicals; and natural products not found in Indo-China, such as petroleum.

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[3] A statement by the President of the Municipal Council.

[4] Figures taken from Bulletin Hebdomadaire d'Information du Gouvernement General de L'Indochine, January 10, 1936.

Thus we have gained a knowledge of Saigon, the city, its hinterland, and trade. As our ship starts its tortuous journey down the river, we find ourselves marvelling at the changes which have taken place. When we realize that this has been accomplished thru the efforts of the French, of whose colonizing activities little is known, even in France, we can see that the claims of Vincent in 1872 that, "France in the east is, as far as my limited observation goes, a great farce—a travesty, a burlesque upon colonization in general," has not stood the test of time. His opinion that "a visit to Saigon, the infant capital of Asiatic France, leaves a ludicrous impression indeed upon the mind of an observant, thinking, and reflecting traveller," is far different than ours. We will remember Saigon above all as a busy, interesting, international port, closely tied to a productive and populous hinterland.

RECOGNITION OF CLIMATE TYPES

T. W. Birch
Gateshead Secondary School, England

The interpretation of climate statistics in words as well as in grafs and maps is a very profitable and enlightening exercise in geography for pupils of all ages. Monthly temperature and rainfall statistics may be given for an unnamed station, and pupils be required to comment upon them and to suggest where the station might be. This work focuses attention upon the characteristics of climate types, and serves as an excellent method to revise the distribution of climate types either in a particular continent which is under study, or over the world as a whole. The basis of climatic classification, variation within the type, and transition from one type to another all become more apparent and real. Much geography is learned incidentally, such as temperature allowance for altitude, the frequent occurrence of a dry month in regions regarded as wet all year, or the peculiar rise in temperature in monsoon countries as the rainfall decreases, tho the sun's altitude is also decreasing. Such exercises are positive reasoning work for pupils, in which an expression of opinion is sought on statistical information. Training of this type should be a fundamental part of our modern educational system when so much information is published in statistical form. Many pupils seem quite unable to tackle the problem until some systematic method of analysis is introduced. Our purpose is here to outline a method which has met with success in dealing with pupils between eleven and sixteen years of age.

The system involves assessing statistical values to generally descriptive terms. After careful examination of many books and atlases, and checking many examples from statistics, the scale of values shown in Table I was adopted.

TABLE I

Statistical Scale of Values

Temperature		*Rainfall*	
Hot	Over 70°F.	Wet	Over 4"
Warm	50°-70°F.	Fairly Wet	2"-4"
Mild	30°-50°F.	Fairly Dry	1"-2"
Cold	Below 30°F.	Dry	0"-1"

The figures relate to the average temperature or total rainfall, for a month. Any month with an average temperature exceeding 70°F.

would be described as Hot; if between 50° and 70°F. as Warm, and so on. The essential elements in the climate of a region can be described at this stage in a pupil's career by choice of four terms from the above table, for example, hot dry summer, warm fairly wet winter. The first step in the interpretation of climate statistics is therefore to reduce them to this outline form, either by choosing January and July figures, or the warmest and coldest months of the year. In practice it is found to simplify matters still further if these terms are written in symbol form, tho always read at full length. The symbols adopted are shown in Table II. The problem now resolves itself into converting the statistics into an appropriate symbol, and recognizing the type of climate from the symbol. The method of approach may be set out in steps.

1. Draw four small freehand circles ready to fill in with climate symbols.
2. Fill in the first pair with appropriate temperature and rainfall symbols for the warmest month. Add the sign for summer.
3. Fill in the second pair with appropriate temperature and rainfall symbols for the coolest month. Add the sign for winter.
4. Name the Climate Type from the completed symbol.
5. Name the hemisphere by examining whether January or July has the higher temperature.
6. From the hemisphere and climate type, name the probable regions where the station may be.
7. Add any additional information which the statistics reveal.

To comply with numbers 4 and 6, a certain amount of geographical knowledge is involved. This should be given in the lessons preceding such an exercise. For example, young pupils studying the regional geography of South America will be told of the characteristics of the climate of various regions; and these may be reduced to a minimum in symbol form and tabulated. Statistics are then chosen from South America, the pupils transcribe these into symbols, and then identify the symbol as belonging to a particular region. Examples may be chosen from any part of the world for pupils who have covered the world in their syllabus. Any attempt to name a place at sight and then to try to prove the correctness of the guess is to be discouraged as the approach is all wrong.

The following table indicates broadly the principle types of climate in symbol form. It may be modified at will, and can be adapted to the use of a given teacher or class.

Table II. CLIMATE TYPES AND SYMBOLS

HOT BELT	Equatorial	Ⓗ +◍ Ⓗ ◍,	Sudan	Ⓗ +◍ Ⓗ ○,	Monsoon	Ⓗ +◍ Ⓗ ○,	Sahara	Ⓗ +○ Ⓦ ○,
WARM BELT	Mediterranean	Ⓗ +○ Ⓦ ⊜,	China	Ⓗ +◍ Ⓦ ⊜,	Continental or Turan	Ⓗ +⊜ Ⓦ ⊖,	Iran	Ⓗ +⊜ Ⓜ ○,
COOL BELT	West Europe	Ⓦ +⊜ Ⓜ ⊜,	St. Lawrence	Ⓦ +⊜ Ⓒ ⊜,	Continental	Ⓦ +⊜ Ⓒ ○,	Altai	Ⓦ +⊖ Ⓒ ○,

KEY. Ⓗ Hot Ⓦ Warm Ⓜ Mild Ⓒ Cold + Summer , Winter

◍ Wet ⊜ Fairly wet ⊖ Fairly dry ○ Dry

Among advantages which can be claimed are the general application of the method to pupils of all ages, the small amount of memory work involved, the sense of security that is felt in its application, and the large number of examples which can be taken in a short time. A rough statistical interpretation is given of climate types, and this can be used in comparisons of climate regions. No complications arise due to hemisphere, as the same symbols are applicable to both. The teacher can also build up his own table of Climate Types and Symbols, and employ in it the nomenclature he favors. This is a most important point, for there is a multiplicity of terms in use in textbooks. The writer recently examined the nomenclature in twelve English school geographies, and found that tho there were less than twenty climate types described, ninety nine terms were employed, and no two authors used an identical series of names for their climate types. Symbols reduce them all to common denominators.

Stations can be chosen with a view to their difficulty of identification. In the lower school only places with climate statistics characteristic of a type will be given. In the middle school modifications of the type can be introduced for example:—

Station A. (Swakopmund, Southwest Africa)

Temperature	January, 63° F.	July, 54°F.
Rainfall	January, 0″	July, 0″

The symbol for these figures does not appear in Table II, but the station is evidently in a desert in the Southern Hemisphere. The cause of the low temperature will be attributed to the cool Benguela Current off shore. Such difficulties as these do not lead to a confusion of ideas, but to a better appreciation of the climate region concept.

Among senior pupils, position within the statistical range for the symbol should be observed. There is a material difference between temperatures of 51°F. and 69°F., tho they are both described as warm. If modification of symbol seems necessary to make it correspond to a type, the former temperature could be regarded as indicating Mild conditions, and the latter as Hot, but not vice versa. The following statistics should not evoke the simple response that the place is in a region of North West Europe Type of Climate, in the Northern Hemisphere, but reasoned mention should be made that it appears transitional towards Continental Type.

Station B. (Berlin)

Temperature	January, 31°F.	July, 65°F.
Rainfall	January, 1.5″	July, 3.1″

Profitable work can also be done with stations where altitude is an important factor. Examples could be multipled to show that the exception and the border-line case lead to a greater increase of knowledge than the perfectly normal or ideal case. Choice must be made according to circumstances.

Finally, lest it be urged that reduction to a symbol is superfluous, it may be said that in practice this seems the point upon which the whole thing pivots, giving the work interest and a visible simplicity.

EDITORIAL NOTES AND NEWS

Time passes rapidly and in its passage leaves a record of successes and failures. Our attention has just been called to the interesting fact that this issue marks forty years of continued publication of the JOURNAL. Forty years ago the JOURNAL was planned and brought into being by Professor Richard E. Dodge. For thirteen years he financed and guided it in its youthful development. He was also the first president of the National Council of Geography Teachers and continues his devotion to the cause of geographic education. He builded well. To the best of our knowledge the JOURNAL is the oldest magazine for teachers in America devoted to a special subject.

The Boston Association of Geography Teachers is continuing its publication of a four page bulletin, edited by Leonard O. Packard, and sponsoring three meetings a year. At the fall meeting Maurice Leahy was slated for an illustrated lecture on "Ireland Moves Forward."

HARRIET SMITH, Secretary-treasurer of Gamma chapter of Gamma Theta Upsilon, Huntsville, Texas, reports a membership of 84 active and 10 honorary members. At the fall initiation and banquet, the chapter was addressed by Dr. George Schlesselmann of the Texas Agricultural and Mechanical College on "Some Geographers and Their Contributions to Science." Nationally known geographers sent greetings, mimeographed copies of which were at each plate, the original letters being bound and presented to the chapter for its files.

A series of exchange lectures has been arranged between the Departments of Geology and Geography of Northwestern University and Washington University. Dr. William H. Haas of Northwestern will lecture on problems of the tropics, with special reference to specific parts of Latin America, while Dr. Thomas of Washington University will devote two lectures to Saint Louis, one to the Ozarks, and another to land utilization and economic trends in Missouri.

The Wisconsin Conservation Department is planning to plant a billion fish in 1937 in its thousands of lakes and miles of trout streams. Portable oxygen aerating tanks will permit truck transportation of fish up to 300 miles. No state has ever attempted such large scale propagation. The recreational aspect of fishing can thus be promoted and at the same time the conservation of game fish will be assured.

The Nebraska State Council of Geography Teachers is of age. Twenty-one years ago, Dr. Bengtson, chairman of the department of geography, University of Nebraska, called a meeting of geographers in Omaha to organize a state chapter of the National Council. Ever since, the Council has been active in bringing distinguished guest speakers to the state meetings. It has also been a center for the dissemination of inspiration, and helps to the classroom teacher, as well as presenting its members with a five page mimeographed bulletin issued five times a year. A new feature of the bulletin is a children's page designed to mix fun and work and stimulate originality.

Representatives of eight Southern Appalachian states met this fall with representatives of the T.V.A. to discuss large scale planning of the recreational resources of the Southern Highlands. The Shenandoah and Great Smoky National Parks are the best known areas but many others are expected to become equally attractive when made accessible. Local development within a state will be left to that state's Planning Commission but, it is hoped, that it will be integrated with those of the other states.

The summer of 1932 marked the first successful crossing of the Northeast Passage in a single year. For 400 years explorers tried to negotiate a crossing, but it was not until 1868 that Nordenskiold succeeded, but then only after being forced to spend a winter near Bering Straits. A similar experience befell each of the next two successful crossings, that of the Russian, Vilkitsky, in 1914-1915, and of Amundson in 1918-1920. Then came the summer of 1932 when the Russians made the passage in two months. This was followed by other Russian experimental expeditions when some spectacular rescues were effected by powerful ice breakers, planes, and radio service. Finally, the year 1935 might be said to mark the turning point from experimentation to the establishment of regular schedules to various parts of the Arctic, particularly to the Kara Sea. Now in addition to the mechanical development aiding navigation, there are sailing charts, meteorological services via radio, and maps showing the character and distribution of the forests and tundra, and the mineral resources of that vast region between the Ob and the Yenisei rivers. Altho the Kara Sea is open only 100 days in a year, already cargoes of wood products, furs, fish, and phosphate rock (apatite) have moved west into world markets. Research is directed toward the maintenance of healthful and enjoyable living conditions where mushroom towns, especially at joint river and sea ports, now exploit these resources. It is reported that Kirovsk, the phosphate mining center of the Kola Peninsula, already boasts a population of 40,000. Efforts are also directed toward a permanent occupancy centered around self-sustaining farming and industrial activities and a long time program for the wise use of the native plant and animal life. To offset disease and the dreaded melancholy of the long polar night, different types of entertainment and the amenities of civilization are provided, special diets are prescribed together with monthly medical examinations. Such is the transformation of what only ten years ago was a wilderness inhabited by primitive peoples, more often exploited than educated by their few contacts with the white man.

The Missouri Council of Geography Teachers held its annual meeting in November, in Kansas City. Those appearing on the program were C. E. Marston, Principal of Blenheim School; Dr. Sidney E. Ekblaw, professor of geography at the University of Kansas City; Mary E. Keith, supervisor of intermediate grades, State Teachers College, Maryville; and M. H. Shearer, teacher of physiography, Westport High School, Kansas City.

The soy bean, a newcomer in United States' fields but a decade ago, in 1934 actually exceeded in bushel production our old staple crops, rye and flax. No wonder, then, that it has found its way into Chicago's Board of Trade so long dominated by our grains. The production is still concentrated in Illinois, which usually produces as much as all the other states put together. In many places it is not allowed to mature but cut green for hay or "hogged" down in the field.

GEOGRAPHICAL PUBLICATIONS

Vernor C. Finch and Glenn T. Trewartha. **Elements of Geography.** 752 pages plus appendices and index. McGraw Hill Book Co., N.Y. 1936

The purpose of this text, as stated by the authors, is "to supply textual material covering the elements of geography in a form particularly suited to class room discussion in beginning courses in college geography." The first three chapters set forth the field of geography, present the fundamental facts of the earth and its planetary relations, and discuss maps and their uses. The authors consider the fundamental purpose of geography is to delimit and describe the regions of the earth rather than to point out relationships or adaptations of life forms to environment.

The text is divided into three parts: I—The Natural Elements of Landscape; II—The Cultural Elements of Landscape; III—The Geographic Realms. Part I, 560 pages, is divided into five "Sections," the Sections into chapters, the chapters into subheadings and serially numbered topics. The concepts of temperature, moisture, air pressure, winds and storms are developed with a clarity found in few textbooks. Nine plates of outline maps and graf charts give opportunity for further student activity. Köppen's classification of climates, with a simplification of terminology, is used.

A brief discussion of the processes concerned with the origin of land forms is followed by 154 pages of description of land forms, their distribution, and stages of development; 130 pages are devoted to the discussion of Earth Resources: Water, Biotic Resources, Soils, and Minerals.

In Part II, the authors offer the first classification of cultural features of landscape that has been made. The main factors in the determination of each type are stated and examples of each are pointed out.

The final 100 pages, Part III, is a "regional synthesis and summary of natural features" in which the whole is brought together by a grouping of the areas in five Geographic Realms: The Humid Tropical Realms; The Dry Realms; The Humid Mesothermal Realms; The Humid Microthermal Realms; and the Polar Realms. Here only do the authors devote much space to expression of relationships or adjustment of life to its environment. In the preceding pages they have laid an excellent foundation for this closing summary. Their logical and interpretative approach to each topic is highly commendable and will be of great aid to the student who encounters difficulties in beginning courses in college geography. No space is wasted on conventional pictures. The division of the material is easily adjusted to either quarter or semester courses. This book will undoubtedly receive a general welcome.

Indiana University J. E. SWITZER

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THE BULGARIAN VALLEY OF ROSES*

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Cradled between parallel mountain ranges in central Bulgaria, and hence protected from the fierce north winds of winter, lie several small but fertile valleys. Of these the most important are the depressions in which flow the two rivers, Strema and Tunja. There was a time in past geological ages when the two valleys were one, drained by a stream which flowed into the Black Sea. Today the two valleys are the source of one of the rarest and costliest products of the vegetable kingdom: attar of roses. France, Turkey, Persia, and India likewise grow roses for commercial purposes, but Bulgaria far outranks Turkey, the nearest competitor, in annual production for the world market.

THE NATURAL SETTING

The valley of the Tunja River, dominated by the small city of Kazanlik, is about forty-four miles long and from five to seven and one-half miles wide; the valley of the Strema, with the town Karlovo as the cultural focus, is barely twenty miles long and only four and one-half miles wide. Since the two valleys have a common origin, since they lie end to end with merely a low divide between them, and since they exhibit an almost identical landscape both physically and culturally, they can be considered as a unit and called the Bulgarian "Valley of Roses."

The trend of the Valley of Roses is essentially east and west. To the north lie the main ranges of the Balkan Mountains, and to the south, the so-called Anti-Balkans. Situated mostly between elevations of 1000 and 2000 feet, the Valley is lowest in its southern portion, and accordingly contains much south-sloping land which is especially good for rose plots because of its exposure to the sun.

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*The writer is indebted to Dr. Ernest S. Guenther, Chief Research Chemist of Fritzsche Brothers, Inc., for furnishing the illustrations.

The Valley of Roses is not only the most extensive rose garden in the world, but contains also magnificent walnut trees, and herds of sheep and cattle. Dozens of small villages three to five miles apart and interconnected by wagon trails dot the landscape. Plots of corn, wheat, and potatoes are interspersed among the rose fields, for roses are merely a cash crop and cannot provide sustenance for the farmer or his animals. A slight zoning influence is noticeable, in that the rose plots tend to occupy an intermediate position on the side of the valley, between the beech forests of the upper slopes and the grain fields of the flat bottom lands. Plantings of tobacco, vines, and mulberry trees give an indication of other economic activities in the region.

THE GROWING OF ROSES

The oil-bearing rose was introduced from Turkey more than two centuries ago. Because of the rich soil and favorable climate the plant rapidly adapted itself to its new environment, and the distilling industry flourished. Two varieties of roses are grown for their oil. The more important of these is the red Damascus rose *Rosa Damascena,* which gives good yields of excellent attar, but which has rather low resistance to plant diseases and is sensitive to unfavorable weather conditions. The other is the common white rose *Rosa Alba,* which is much hardier, but whose blossoms, tho more numerous than those of the red rose, give a smaller percentage of distinctly inferior oil. Accordingly, the distillers of attar of roses encourage the farmers to grow red roses, whereas the farmers often prefer to grow white roses because of the smaller risks involved.

A rose plantation requires constant care. Aside from the initial plowing and planting, a rose plot has to be hoed five to eight times and plowed five to eight times every year. During the winter, young bushes must be protected from the cold by covering them with earth. Periodically the shrubs must be trimmed and fertilizer applied. It is quite evident that a peasant who owns a plot of roses is closely tied to the soil.

HARVEST AND DISTILLATION

But it is during the harvest season, from mid-May to mid-June, that activity in the rose fields reaches its peak. Sleep is forgotten in an intensive effort to keep the harvesting in step with the quick maturing of the blossoms. The women and children of the peasants start to pick flowers about 4:00 A.M., tho they usually stop by noon. The early start is made possible of course by the closeness of the harvest period to the summer solstice. The picking is not continued thru the afternoon because the high temperature volatilizes much of the essential oil in the flowers and thus greatly decreases the yield. The best yields are obtained on cool, still mornings when moisture in the form either of dew or of rain has condensed from the atmosphere. On such days as little as 2600 pounds of rose petals may yield a pound of attar of roses. On hot or windy days more than three times as much raw material may be required. Two tons of petals for a pound of distilled attar is a normal average. In order that the harvest of rose petals may be as great as possible, the whole year and particularly the harvest season must be characterized by high average humidity and frequent rains. If the weather is dry or hot, the rose bushes bloom rapidly, their flowering season lasts only ten or fifteen days, and an excess of flowers is produced daily which it is impossible to gather and distill on time. Under such conditions the yield of attar is greatly decreased and its quality is impaired because the rose petals undergo a slight fermentation before distillation. It may be said that the yield of rose blossoms in pounds an acre in any year depends to a large degree on the climate during the preceding growing period, whereas the yield of attar of roses from a ton of rose petals is a function mainly of the weather on the day of harvest and distillation.

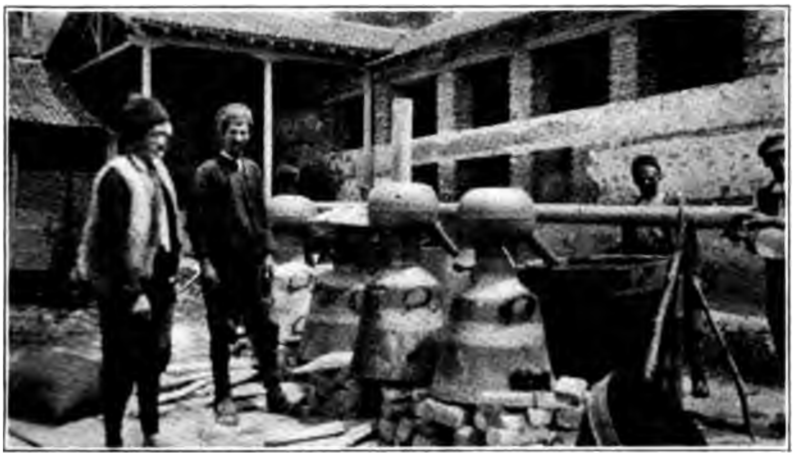

FIG. 1. Old-fashioned rose distillation in Bulgaria.

While the women and children are gathering flowers in the fields, the men are taking filled sacks on donkey-back or in wagons or oxcarts to the nearest village, in order to sell their crop to the agent of a distilling company. The petals are sold by weight, usually at a prearranged standard price. In the old days the farmer would take his rose petals home to his courtyard for afternoon distillation, or he might set up his apparatus under a tree near his rose plot where a running stream could be used to cool his distillate. The old-fashioned stills have been described as "Kansas milk cans surmounted by a stork's head with a hollow bill." They consisted of conical boilers about forty inches high, made of copper but tin-plated on the inside, and having a capacity of thirty or forty gallons. The truncated upper part was constricted, and ended in a cylindrical opening into which the "stork's head" was set. The "bill" was joined to a tin pipe, which led thru an ordinary wooden barrel filled with running water and thus served as a crude condenser. On the other side of the barrel the pipe ended directly above a glass bottle in which the distillation water was collected. A visitor to the Valley of Roses in 1893 relates the following:[1]

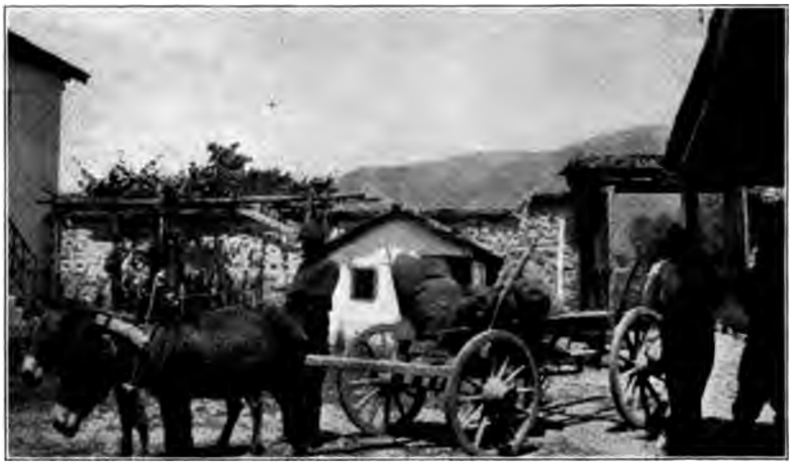

FIG. 2. The arrival of flowers at a modern distillery.

"The preparation of attar of roses is a simple distillation, but this is carried on in the crudest and most primitive manner. For example, the supposedly air-tight joints between the retorts and the flasks are merely fashioned by wrapping an old turban around them. It is clear that fully double the yield of rose oil could be obtained if the process were carried on more rationally under the supervision of trained chemists. As it is, so much rose water is lost from the badly connected apparatus, that the ground all around is softened by it (the distillation is usually carried on in unplastered back yards) and one is forced to wade around in this half precious, half revolting mush up to his ankles. One would be mistaken to think of big factories in connection with the preparation of rose oil. It is exclusively a matter of a small home industry, and on this rests the relative prosperity of the region."

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[1] K. Floericke, Bulgarien und die Bulgaren, p. 10. Stuttgart, 1916.

This state of affairs no longer prevails. Only because of Bulgaria's remoteness from the centers of technological progressiveness could attar of roses continue to be produced for so long in such impossible apparatus. Today only a small amount is prepared by such primitive methods, mainly by small farmer cooperative organizations, which, tho state-subsidized, are not very successful. Most of Bulgaria's attar of roses is now produced under standardized procedure in some thirty more or less modern factories, which are owned and operated to a great extent by foreign capital. The main reason why individual farmers and farmer cooperatives do not do more distilling is that they lack the efficient export and sales organizations of the larger private companies. They usually have to sell their product to these concerns, and thus have to content themselves with a very moderate profit.

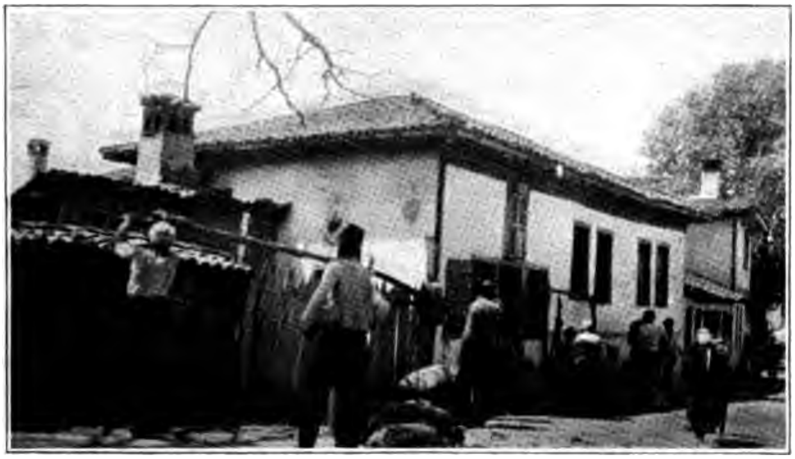

FIG. 3. The weighing out of flowers.

A typical modern distilling plant consists of a long, narrow building without windows, but completely open on one side. It faces a courtyard which during the harvest season contains sacks of rose petals and huge heaps of cut wood for heating the direct-fire stills. Down the main axis of the building, under the sloping, tile-covered roof, six or eight stills of perhaps 400 gallons capacity rest in a stone or brick foundation punctured in front by large fire holes. The old-fashioned distilling plant was built on essentially the same lines, tho on a much simpler scale.

The fundamental process in both kinds of distillation is the same. A large quantity of rose petals is placed into each still, and several times their weight of water is added. The vessel is then heated on the outside, either by a direct fire, or by steam. The vapors pass thru a condensing tube cooled by running water, and condense to "rose water," which may or may not have a layer of oil floating on it. The rose water is partly redistilled, and on the surface of the new distillate a layer of oil collects, which is carefully separated by means of a special kind of conically shaped spoon. The oils are united, and constitute the attar of roses of commerce—a yellowish or yellowish-green liquid which assumes a pasty consistency below ordinary room temperatures because of the odorless waxy solids which it contains. It is one of the most useful raw materials in the manufacture of perfumes.

SECONDARY PRODUCTS

In Bulgaria the odor of roses is so well liked that it is used extensively in the preparation of gastronomic delicacies. One of the best preserves made by Bulgarian women is rose-leaf "sladko." It is prepared and consumed thruout the country. Puddings are often flavored with rose water, and even some wines betray the odor. One of the oddest by-products of the rose distilling industry used to be "rose butter," a substance of waxy consistency which collects on the hands of the girls and women who pick the petals. In the days of Turkish rule this material was prized more highly than the attar itself. It was carefully scraped off the hands of the pickers and sold to rich Turks, who would add a little of it to their tobacco, and thus perfume the whole atmosphere when they smoked. This custom seems to have declined, however, with the abolition of the harem.

UNETHICAL PRACTICES

For many years attar of roses has been exported from Bulgaria in tin-plated copper flasks of distinctive shape. The weighing and sealing of these containers has long taken place under direct government supervision. In spite of this, the stigma of adulteration has been repeatedly cast on Bulgarian rose oil. Some of the criticism is certainly justified, some of it quite as certainly not.

Adulteration—"sophistication," as the essential oil trade is pleased to call it—was undoubtedly more widespread in the past than it is today. In the old days, when the individual farmers did their own distilling, and when the government had not yet begun to control the purity of the attar of roses to be exported, adulteration was often practiced several times on the same batch of oil. First the farmer himself would increase his yield by sprinking geraniol, one of the cheap constituents of attar of roses, over the petals before distillation. Then the middle man who bought the oil from the farmer would "stretch" it by adding some more adulterant. And finally the wholesaler outside the frontiers of Bulgaria might dilute it a little more.

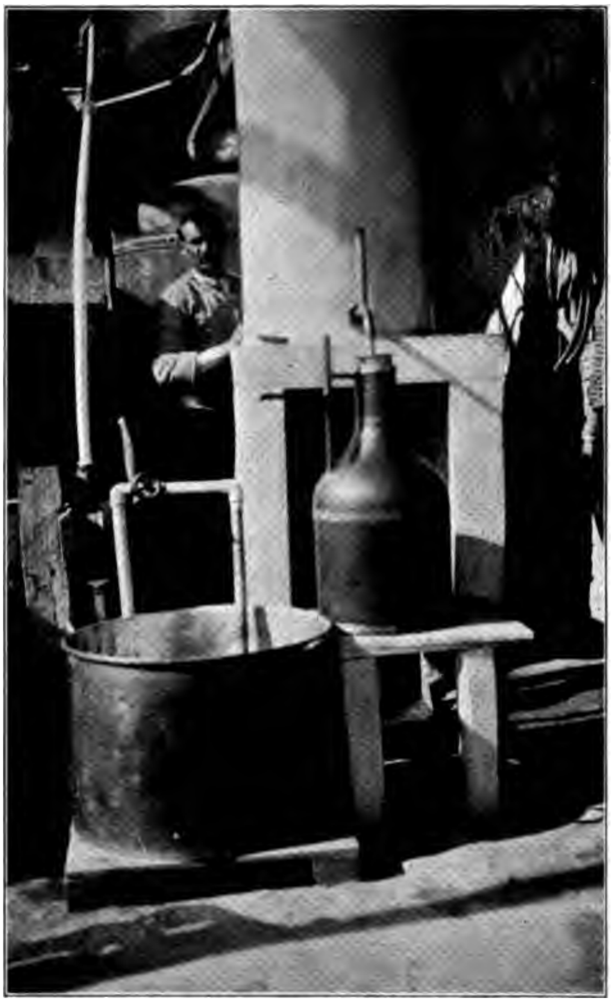

FIG. 4. Modern industrial rose distillation. The florentine flask in which oil and water separate.

Today the Bulgarian government has prohibited the importation of oil of geranium, oil of palmarosa, and other such substances which might be used to adulterate rose oil. Heavy penalties are imposed for smuggling in such materials, and yet they are offered for sale to the peasants more or less openly thruout the Valley of Roses. Since, however, the peasants nowadays distill only a small fraction of the total amount of attar of roses produced, falsification from this source can play only a minor role; and falsification on the part of the larger distilleries is unthinkable. Consequently, tho the annual statistics for the export of rose oil are considerably greater than production figures, adulteration is not nearly so prevalent as this fact alone would seem to indicate. The main reason, rather, for this discrepancy—and this point sheds an interesting side light on the character of the Bulgarian peasant—lies not in falsification thru dilution, but rather in the reticence of the individual peasant to declare the true quantity of attar of roses which he has produced, for fear of having to pay higher taxes. He is "moved by an innate feeling to conceal the state of his fortune and to have himself believed poorer than he really is."[2] For this reason the peasant understates his yield of rose oil, and causes the total annual production figures to come out lower than they really are, whereas the export figures are compiled by the government customs bureau, and are exact.

ECONOMIC CONSIDERATIONS

The actual amount of land used for the cultivation of roses in Bulgaria has varied rather widely with the years, as the following table will show. Since almost all the cultivation occurred in the Valley of Roses, it is evident that the crop pattern there must have undergone great changes.

Year	Land under Rose Cultivation (Acres)	Total Yield of Flowers (Short Tons)	Average Yield of Flowers (Tons an Acre)
1897†	10,391	9,839	0.95
1907†	17,611	10,772	0.61
1917†	21,404	12,945	0.60
1927†	12,051	9,934	0.82
1935*	16,533	12,436	0.75

†L. Jozoff, Das Rosenöl. *Das Rosental,* V. 1, No. 1, p. 5, Bulgaria, 1935.

*Private communication from Professor As. Zlataroff of the University of Sofia, Bulgaria.

Even in Bulgaria itself, attar of roses is not too important in the domestic economy. In 1935 it ranked no higher than fifth in value in the list of exports, and only ninth in total acreage. Its export value was less than one-thirtieth that of tobacco. Obviously, then, one is dealing here not with a large industry which might be considered the basis of Bulgarian prosperity, but rather with a relatively small activity which is significant geographically only because of its extreme localization, and interesting because of its unusual character.

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[2] As. Zlataroff, La Rose et l'Industrie de l'Essence de Roses en Bulgarie, p. 9, Bulgaria, 1926.

In the days of Turkish rule over Bulgaria, most of the attar of roses was sent to Constantinople, but since the middle of the last century a constantly growing percentage has found other destinations. First the capitals of Europe were ready markets, and then America. Today the United States ranks first in the import of this luxurious fragrance, followed by France, England, Switzerland, and Germany.

SMALL SCALE PURCHASES

The visitor to central Bulgaria generally wants to take home some small gift bottles of attar of roses. Tiny "muscals," which are vials containing about a sixth of an ounce of the costly liquid, can be bought locally. However, the purchase can be concluded only after extensive bargaining, unless the customer is willing to pay twice too much. To the westerner the necessary haggling is often distasteful, but in Bulgaria—south-European and strongly orientalized—it is inescapable.

If time is plentiful and patience not wanting, let him deal directly with one of the small distillers. At the outset he will probably have to submit to a tour of inspection of the plant, just to prove to himself, his host says, that everything proceeds ethically. Next he may be invited to the home of the distiller himself and bribed by his wife, unless it be a Mohammedan household, by means of some "sladko" or other delicacy which he must of course accept for courtesy's sake. During his host's discussion of the hardness of the times and the poorness of the crops he will be further befuddled by drinking repeated cups of concentrated Turkish coffee and smoking a goodly number of native cigarettes. Finally, inevitably, the defenseless customer will surrender, and agree to pay a stiff price for his souvenirs. Then the host will unlock a cupboard, take out a small bottle of attar of roses, warm it in his hand to dissolve the precipitated wax, and carefully weigh out the desired quantity before the eyes of his guest. With a sigh of relief the exhausted visitor takes his prize from his bowing host, pays his money, and departs. What does it matter if the attar is adulterated? He cannot tell the difference, nor can any of his friends. And it does smell divine.

THE STUDY OF CITIES AS A CONCLUDING UNIT IN ECONOMIC GEOGRAPHY

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University of Wisconsin

THE PROBLEM

Doubtless most teachers of geography in secondary schools[1] have sensed the difficulties involved in concluding a course in economic geography in a thoroly satisfactory manner. Careful planning is required to bring the course to a close with a unit that is a fitting climax, and that provides, in addition, a thoro overview and summary of the preceding work.

The common lack, in geography, of a cumulative building up of facts and ideas grows in part out of the very nature of the subject. Instead of each topic or problem resting firmly on the preceding ones, it is more often true that each, tho related to preceding ones, stands more or less by itself. In the words of an observant college student, it is like climbing up and down a row of step ladders. Economy of learning as well as of interest makes desirable, wherever possible, a progression, a pyramiding of topics and problems. Especially does it seem desirable to have at the end a unit which depends on the preceding ones for a large part of its basic facts and ideas.

The failure to use the major findings of each division of the work in the division immediately following also makes a thoro review highly desirable if not imperative. All experienced teachers of geography know that repetition of basic data is essential, and that a review after the whole field has been covered is particularly valuable. To secure a *review* that is a *new* view of the major items, a view that will be stimulating and yet not too diverting, is a vital part of the problem.

A review, moreover, needs to be narrowly selective—a summation. Much of the factual material in geography is so much water to make the wheels of the mind go round—it is not to be recalled. It has done its work. Some kind of a procedure that will pick out the highlights should be adopted. If this can be incorporated as a part of the concluding unit, it is easier to enlist the whole-hearted cooperation of the students.

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[1] Junior and senior high school and junior college.

URBAN GEOGRAPHY OFFERS A SOLUTION

The writer has experimented with various solutions to this need for a closing topic that gives a vigorous review of the essential facts and ideas, and that constitutes a fitting climax to the course. Among the more workable have been: (1) journey geography, (2) an analysis of the interdependence of regions, largely thru trade, and (3) a study of cities. The appropriateness of any one of these will depend, of course, on whether its novelty has been exhausted earlier in the work. This discussion will develop the use of the third, city or urban geography.

The method is, in brief, to select representative or outstanding cities for study as the last phase of the work. For systematic economic geography, the choice might well be made from a list of the cities of more than one million population. These will be found to reflect quite accurately the major items in economic geography. For the geography of a continent, it seems desirable to keep to cities of one hundred thousand or more, the so-called "great cities." For a state, the most useful list consists of the larger urban centers and of a sufficient number of the smaller ones to give representative cities from the contrasted regions of the state.

THE MERITS OF THE PLAN

A study of selected cities clearly meets our requirements for a concluding unit. Each city epitomizes the region of which it is the dominant trade center, and in its trading and manufacturing activities reveals much about distant areas; one can hardly understand a city without calling to mind, *reviewing* from a *new* viewpoint, the major facts about the region it serves. Thus the review and summary are secured. But more than that, some new material is introduced which builds on that which has preceded, thus giving a pyramid cap to the broad regional or topical foundation laid in the preceding weeks. These merits of city study depend, of course, on some of the basic facts of the human geography of the Twentieth Century—that the peoples of the commercial world are pretty largely nucleated in cities, which must of necessity reveal the character of the peoples and lands of which they are the centers of industry, commerce and communication. This urban dominance is notably characteristic of the United States and Canada, the Plata River Countries, Australia, and Western Europe.

Another merit of city study as a culminating topic in economic geography is the ease with which it can be carried out. Materials are commonly available for cities even tho lacking for the region to which they belong—photos, street maps, trade statistics, historical accounts, Chamber of Commerce publications, federal commerce reports, port descriptions. The student who takes a city as a special topic on which to report is certain of some measure of *success* in his search for materials.

Teaching the Unit on City Geography

The successful direction of this unit involves an acquaintance with the available source materials and with the capacities of the participating students. These vary so widely that it is difficult to generalize. The teacher can, perhaps, assign readings as the basis of discussion; he can develop the whole topic by skillful questions, by drawing out what the pupils know of the tributary area of the city, and by filling in with data of his own; he can resort to the easier method of "telling," or reading aloud particularly good selections; or he can have oral reports by members of the class on selected cities.

In directing the preparation and presentation of the oral reports, it is desirable to make the individual assignments near the middle of the course, after the work is well under way and the capacities of the individual students are known, but early enough to give plenty of time for the search for data. It generally proves best, moreover, to assign each city to an alert student who stands in the upper third of the group, or to a committee with such a student as chairman. A study guide should be provided, indicating what to look for and where to find it. A summary of findings, in the form of a series of short statements (a "brief"), is required of each committee a week or so before the unit on cities is taken up by the entire group. If not satisfactory, it may be returned for further work. From the accepted briefs, the teachers can select the cities on which oral reports are to be made. Perhaps some of the studies are so imperfect that they are not worth presenting. The oral report may cover the subject matter of the entire brief or it may consist of the portion which in the teacher's judgment is most worthwhile. Very commonly it is best to restrict the oral reports to the more valuable portions of the better briefs. All of these steps are doubtless clear enough except, perhaps, the content of the study guide.

A STUDY GUIDE FOR ORAL REPORTS

The study guide, which may be dictated, posted on a bulletin board, or mimeographed, should include specific directions to the available sources (which vary widely from school to school), and a set of questions or problems to guide the students in their work. Altho the list of problems may well be fairly comprehensive, it should be remembered that some of them may have to go unanswered, and, moreover, that the brief or summary of findings need not follow precisely the outline suggested by the problems.

Of the possible problems in harmony with the objectives of the unit we select seven, all of them aimed at revealing the city as an organic unit epitomizing the geography of the region it serves. (1) What does the city look like (the *landscape*)? What is its shape, its street pattern; of what contrasted districts, such as commercial and manufactural, is it composed? (2) What is the nature of the area which the city occupies (the *site*)? What have been the good and bad features of the site for urban use? (3) When was the city started and why was this particular site chosen (*origin*)? (4) How has the city grown to its present size and importance (*evolution*)? What stages in its growth can you discover? How are they related to the development of the region in which it lies? (5) How do its people make a living today (*function*)? Consider trade, manufacturing, and other functions such as political and educational. (6) How is the city located with respect to raw materials for manufacture, power resources, richly productive lands, trade routes, and so on (its *situation*)? How are the activities (functions) of the city related to these resources and to the needs of the near-by and more distant lands and peoples. (7) What problems more or less peculiar to the city and its region are faced? (e.g. water supply for Los Angeles, flood control for New Orleans).

The problems selected, the local library resources, and the capacities of the students, will dictate the sources to be listed in the study guide. Encyclopediae and articles in current magazines, such as *The American City* and *Literary Digest,* are available where there is a good library. The ***Readers Guide*** is an invaluable aid in locating current magazine articles on cities. Among the geographical magazines the ***National Geographic*** and the ***Journal of Geography*** are especially useful. Maps in geography texts and atlases show major elements of situation. Accounts in history texts and local histories throw light on the evolution, as do the census reports. Federal reports, especially those for ocean ports, are invaluable. Topographic maps, obtainable for many cities from the United States Geological Survey for ten cents a sheet, commonly give many of the critical details of site, and Chamber of Commerce and Board of Trade publications can be relied upon for maps, photographs, and ideas, tho all factual statements must be used with caution. Commonly much of the material used in the earlier part of the course can be used again in this connection. Careful provision of suitable source materials for the cities assigned is essential to the success of a study of cities as the culminating unit in a course in economic geography.

THE DEVELOPMENT AND FUNCTIONING OF THE PORT OF CHURCHILL

IDA MAY SHRODE
Pasadena Junior College

The natural harbor facilities of Churchill have been occasionally utilized since 1619. With the establishment there in 1670 of a Hudson's Bay Company trading post, Churchill became a link in that chain of posts which, by holding together the fur empire of that company, helped also to consolidate British power in North America. During the past two and a half centuries several hundred voyages have been made to Hudson Bay, and altho they have never maintained set sailing schedules, the principal fur trading companies still send ships there every summer to gather peltries collected during the winter.

HISTORY OF THE HUDSON BAY RAILWAY

Agitation for improved facilities for utilizing the Hudson Bay route to Europe has ultimately resulted in the installation of modern port forms at Churchill. This agitation began some fifty years ago in protest at the Canadian Pacific Railway's monopoly of the carrying trade of the prairies. A route to the bay along the Churchill River which had been surveyed by the Hudson's Bay Company for the use of dog teams was first recommended as the best route for a rail link in connecting the prairies with Europe. Finally the railway was completed north to The Pas, but plans for a railway thence to the bay were altered to make Nelson the terminus. After partial development of harbor works at Nelson and the construction of a railroad most of the way there, expert advice caused a readoption of Churchill as the terminus because of its superior natural advantages for port development. These confused plans have made the railway from The Pas to the bay fifty miles longer than it would have been had the original plans for the route to Churchill been followed. The initial cost of the railway was $53,000,000, but this amount has since been augmented by heavy operating losses.

With the completion by the Dominion government of this railroad in 1930, the slender thread which connects Hudson Bay with the wheat country was finished. Upon such a meager contact with its tributary area all hopes for port expansion at Churchill are founded. Constructing and maintaining this railway and the accompanying telegraph line have been accomplished by surmounting serious engineering problems. Because rails are laid on frozen ground, some time must elapse before the ballast settles sufficiently to make fast transportation possible.

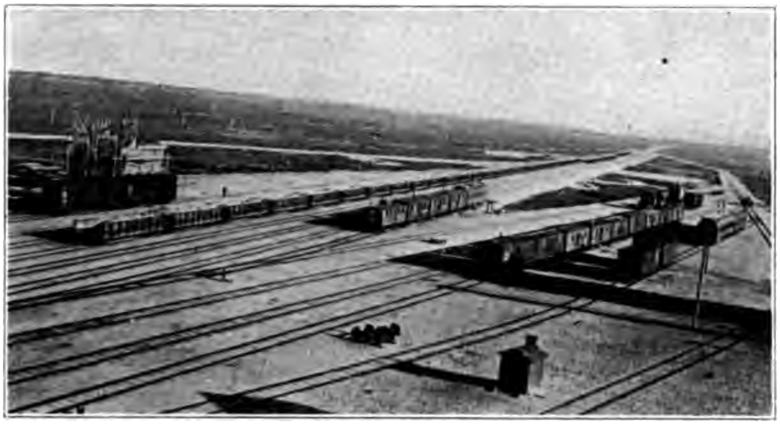

FIG. 1. The railway yards and landscape at Churchill.

Arguments for the construction of a port on the bay have been based chiefly on the saving in mileage which such a port would effect in connecting the prairie provinces with Britain. With a reduction in mileage, a reduction in shipping costs has been anticipated. Liverpool, the great market for Canadian wheat, is 3,007 miles from Montreal and 2,967 miles from Churchill—an insignificant difference. But Edmonton and Calgary in the wheat country are a thousand miles nearer Churchill than they are to Montreal. Saskatoon is 4,878 miles from Liverpool by way of Fort William and Montreal, but only 3,814 miles from Liverpool by way of

Churchill. Thus thru effecting a saving in mileage, the Hudson Bay Railway and the port of Churchill have been expected by Manitoba enthusiasts to revolutionize Canadian commerce. With such hopes in mind, the pattern of the port of Churchill was planned and developed.

THE PORT PATTERN

The harbor at the mouth of the Churchill River to which the port pattern has been adjusted has certain natural advantages. Cliffs from 30 to 70 feet high enclose a harbor six miles long with a width at low tide of from one to two and one-half miles. The bottleneck entrance between headlands is 1,600 feet wide at low water. The tidal range averages about 13 feet. Because of the cliffs which guard the entrance, northeast gales are the only winds which can damage the harbor district. On account of the direction of the river, there is but a short strip on the west side of the entrance and opposite the port site which might be thus adversely affected.

Since the open season on Hudson Bay at best is no longer than from mid-July to mid-November, port construction has been handicapped. Surveys of the channel were made by drilling holes in the ice by means of a steampipe and dropping sounding lines thru these holes. Dredgers built on the site have improved the channel so that it now has a depth of 30 feet for a width of 1,850 feet, and a depth of 60 feet for a width of 750 feet. With additional dredging, the capacity of the harbor could be increased to accommodate more ships than could reasonably be expected to tax its capacity. There are now 140 acres with a depth of 30 feet or more at low water, besides an area of 180 acres with a depth at low water of from 18 to 30 feet.

The townsite of Churchill which has been planned as an essential part of the port pattern, belongs to the province of Manitoba, and lots there are to be leased rather than sold. "The city" has been surveyed and planned by the provincial Department of Railways and Canals which has opened it to settlement. Despite ambitious plans, however, it seems improbable that Churchill will soon be more than a lonely frontier settlement where huskies howl. As late as 1931 the only buildings on the site assigned for commercial and residential use were a church and three tiny buildings occupied by banks. To these public buildings, a motion picture theatre was added in 1932. The permanent population consists of not more than a score of persons, altho construction work and shipping materially increase the summer population.

Preparing the townsite for use has involved leveling the surface and filling muskegs. Water is piped from a lake eight miles away which has been deepened for a reservoir and connected with feeder lakes. A ten-inch pipe line heavily insulated with muskeg carries water to the townsite where a pumping station keeps it moving. The problem of sewage disposal has been solved by the construction of boxed-in pipes kept from freezing by steam. Heat for the town is furnished by the government-owned railway which has four boilers at the roundhouse to provide steam for that purpose.

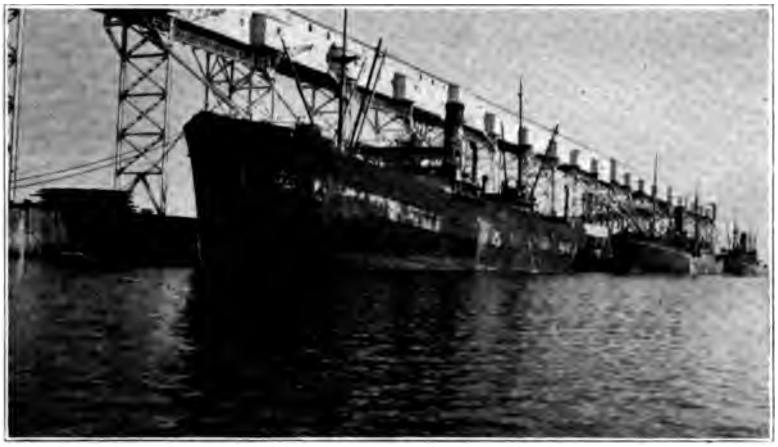

FIG. 2. Three vessels loading at the elevator.

An electric generator at the elevator is prepared to supply electricity for port and town requirements. The railway terminus, a vital part of the port pattern, has fourteen miles of sidings. The roundhouse has six engine stalls which, because of the low winter temperatures, are provided with an unusual system of doors. A mechanical coaling plant has been installed to refuel the railway engines. The powerful radio station aids navigators in checking their position. This help in ascertaining bearings is peculiarly valuable in Hudson Bay where proximity of the magnetic pole makes the compass of little help in determining directions.

To define the shore line, riprap work has been constructed. At low water the cribbing extends 32 feet above and 32 feet below the water level. The quay, proudly called "the docks," is less than a mile from the mouth of the river and about 650 feet from the shore line. Cribbing 28 feet wide extends along the land side of the quay for 1,500 feet. The quay measures 1,800 feet in length. The reinforced concrete elevator, "the most modern in the world," was built in two summers. It has a storage capacity of 2,500,000 bushels, with provisions for extension to a capacity of 10,000,000 bushels. It stands 600 feet back from the deep water cribbing. Its foundations are laid on piles driven thru tidal waters into the underlying frozen gravel. Rock and gravel from the dredgings were filled in nearly to the top of the piling and covered with a concrete mat to form foundations for the elevator. Upon this solid base were built supports for elevator bins.

Because of the short shipping season and late wheat harvest, loading and unloading facilities have been constructed with a view to the rapid handling of wheat. Three ocean vessels can be loaded simultaneously from 24 spouts and eight belts. Transit sheds are served by four tracks to permit unloading 400 wheat cars daily. Each car can be unloaded in less than six minutes by the use of dumpers. All of the loading devices are electrically operated and require the work of very few men.

The Functioning of the Port

The extent to which these port facilities have thus far functioned has been a keen disappointment to many, tho expected by others. In appraising the functioning of the port it must be remembered, however, that Churchill was not completely prepared to handle wheat until 1933, and in that year the wheat market was at a low ebb.

In 1931 two ships carried out wheat on experimental runs. In 1932 ten vessels called to carry out 2,700,000 bushels of wheat, most of which had accumulated in the elevator. At least one of these ships carried cargo consigned to purchasers in the prairie provinces, and one ship brought two passengers. In 1933 ten vessels of an aggregate capacity of 47,445 registered tons carried away 2,500,000 bushels of wheat from the elevator, but only 6,000 bushels of the 1933 crop. In 1934 ten ocean-going vessels of 31,587 total registered tonnage called. Exports for that year included 4,000,000 bushels of wheat, 2,500,000 bushels of which had accumulated in the warehouse, 580 head of live cattle from the prairie provinces, 2,000,000 feet of lumber, and 8 tons of honey.

Inasmuch as some 20,000 vessels a year enter and clear Canadian ports, it is obvious that the number which called at Churchill is a very small percentage of the total. Since the Hudson Bay route has been regarded askance by some shipping companies, shippers, and underwriters, the struggle to have the completed port facilities utilized is a struggle in which the opposing forces of nature are augmented by powerful interests. The open season in Hudson Bay is short because of shore and floe ice. Altho theoretically the season might be extended by ice breakers and by broadcasting information concerning ice hazards, practically the season is confined to the period between August 10 and October 1 because in the weeks before and after that period insurance rates are so high as to be almost prohibitive. A recent reduction for the open season in hull insurance rates has raised hopes that the "political railway" might justify itself on economic grounds and that the port of Churchill might attract more ships. The unfavorable publicity attracted to this route by the loss of a freighter in 1932 after collision with an iceberg in Hudson Strait has been apparently somewhat offset by the more favorable insurance rate.

Optimists hope that a general revival in world trade will increase the use of the port, and they are making some efforts to attract other commodities than wheat. There has been much discussion of shipping Canadian cattle to Europe thru Churchill, as it is contended that this route permits stock to reach European markets more cheaply and in better condition than if shipped thru eastern ports. The increase in the number of head shipped from 250 in 1933 to 580 in 1934 may be suggestive. It has been said that a profitable reindeer industry would help round out the port business, but as yet no study of the character of the moss on the west side of the bay has been made, and the failure of Hudson's Bay Company to develop a reindeer industry on Baffin Island offers little encouragement. Some expect that with the discovery of more mineral deposits in the Canadian Shield, exports of ores to Britain will provide increased port business. It has even been suggested that, if advertised, the ruins of the once impregnable Fort Prince of Wales, now preserved as a Canadian Historic Site across the river from Churchill, might arouse interest in the romance and glamour of early days and develop a tourist business which would spread appreciation of the Hudson Bay route.

To date Churchill has scarcely been a commercial success, despite the installation of modern port facilities and ambitions for their expansion. In both 1934 and 1935 the aggregate annual loss from operating and maintaining railroad, port, and elevator was about $200,000 and would have been higher had not the small profit accruing from the elevator operation decreased the total loss.

Factors, other than those imposed by nature, which seemingly have been most potent in checking the maximum functioning of the port are:

(1) The distress reduction in freight rates from the head of the lakes to Montreal which has given a new stimulus to the old trade route.

(2) The improved Welland Ship Canal, opened in August, 1932, which obviates transshipment of grain at Port Colborne.

(3) The cost of wheat storage at Churchill which, tho at first free to encourage trade, hereafter will cost approximately as much as elsewhere.

(4) The high ocean freight rates charged because of inability of vessels to secure full incoming cargoes.

(5) The high railway freight rates on less than carload lots from Churchill to the interior.

CONCLUSIONS

Commerce is made up of trade flows, and these flows follow lines of least resistance. Churchill enthusiasts have vigorously attempted to decrease the resistance to the Hudson Bay route which natural conditions and hostile competition have engendered, yet probably that route will not soon attract a very significant part of the total flow of Canadian trade. It may be that the future rôle of Churchill's port facilities will be to warn those who set freight rates that if shipping costs to Europe over the southern routes are excessive, the Hudson Bay route can offer a modicum of competition.

CALCULATING ROTATIONAL SPEEDS AND THE LENGTHS OF DEGREES OF LONGITUDE IN VARIOUS LATITUDES

HAROLD S. PALMER
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THE PROBLEM

Recently Dr. Bratton[1] pointed out most vividly the fact that places in high latitudes are carried with less speed by the earth's rotation on its axis than are places in low latitudes. The greatest speed is on the equator, all points of which move with a speed of 25,000 miles a day, or 1,040 miles an hour, or 17⅓ miles a minute. Since the parallel of 60° latitude, either north or south, is a circle just half the size of the equator, all points on the 60th parallel move with a speed of 12,500 miles a day, or 520 miles an hour, or 8⅔ miles a minute. The point at either pole does not travel at all, but merely turns in place something like a soldier executing "Left Face!"

The calculation of these speeds for these special cases is easy, but for other latitudes involves either some trigonometry or some grafical construction such as that given in this paper.

ROTATIONAL SPEEDS FOR SPECIAL LATITUDES

Fig. 1 represents the earth with one eighth of the sphere drawn only in faint lines. The outer circle (EFGNOPQS) represents a meridian and its continuation on the opposite side of the earth. The ellipse, NLHKS, represents another pair of meridians at right angles to the first pair of meridians. NABCS is the axis, with N and S the poles. The ellipse, EKQ, represents the equator with two radii, CQ and CK. The ellipse, FHP, represents the 30th parallel north, with two radii, BP and BH. The ellipse, GLO, represents the 60th parallel north, with two radii, AO and AL.

Let us suppose that Mt. Kenya is actually on the equator, and is represented by the point K. During a day, Mt. Kenya will move the whole length or circumference of the equator. Let H represent Houston, Texas, which is about 30° from the equator. During a day Houston will move the length or circumference of the circle which is represented in Fig. 1 by the ellipse, FHP. Finally, let L represent Leningrad, which is about 60° from the equator. During a day Leningrad will move the length or circumference of the circle represented by the ellipse, GLO. So, if we could measure the lengths of these circles we would know the lengths of the daily journeys of these three points. It is impossible to get the circumferences easily from these ellipses, and it would be rather awkward to measure them on a globe. Fortunately, geometry tells us that the circumferences of all circles are proportional to the lengths of their radii. We could multiply the lengths of the radii (CQ, BP, and AO) by 2π ($\pi = 3\frac{1}{7}$ or 3.1416) and get the circumferences. A simpler way is to draw the diagram to some scale so that the circumferences will be indicated directly by the lengths of the radii. If we were to

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[1] Sam T. Bratton. "Comparative Rotational Speeds," JOURNAL OF GEOGRAPHY, Vol. XXXIV, No. 5, pp. 210-212, May, 1935.

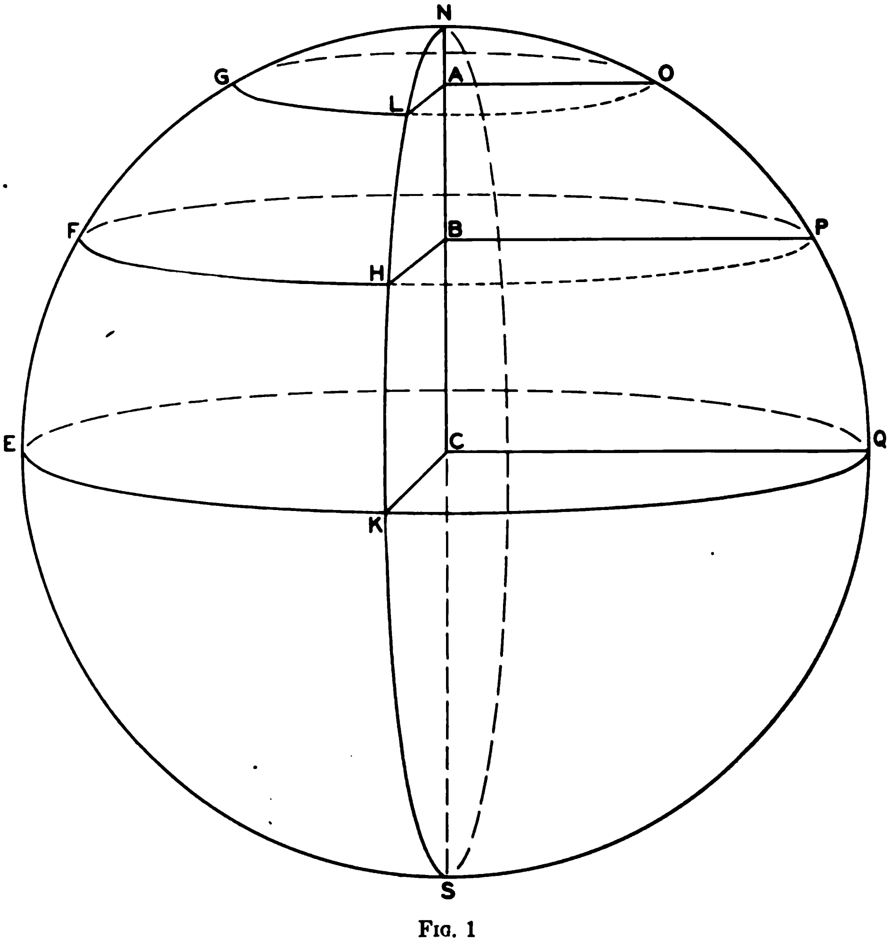

FIG. 1

make a scale that would divide the radius of the circle representing the equator into 25 equal parts, we could let each space represent a velocity of 1,000 miles a day. Measuring the length of BP (the radius of the 30th parallel) on the same scale we would find it to be about 21½ spaces long, which we would interpret to mean that Houston travels twenty-one and a half thousands of miles or 21,500 miles daily because of the earth's rotation. We would find AO (the radius of the 60th parallel) to be 12½ spaces long, so we would conclude that Leningrad is moved 12,500 miles daily by the earth's rotation.

If we wished to express the speed in terms of miles an hour instead of miles a day we might simply divide the results gotten above by 24. Or we might get it directly by using a different scale. Thus, we might divide CQ (the radius of the equator) by a scale such that 10 2/5 divisions, each representing 100 miles an hour, would equal CQ in length, and then apply this scale to the radii of the 30th and 60th parallels. We would find BP to have a length of 9 spaces, which at 100 miles an hour would give Houston a velocity of 900 miles an hour. AO would be 5 1/5 units long and would indicate for Leningrad a speed of 520 miles an hour.

Or we might wish to express the speed in terms of miles a minute, and would make a scale such that 17⅓ divisions equalled CQ, the radius of the equator, each division representing a speed of 1 mile a minute. BP would have a length of fifteen units on this scale and AO would be 8⅔ units long. These lengths would correspond to velocities of 15 miles a minute for Houston and 8⅔ miles a minute for Leningrad.

ROTATIONAL SPEED IN ANY LATITUDE

Similar grafical computations may be made for any latitude. For this we do not need the whole diagram of Fig. 1. The quarter-circle, NCQ, will suffice, and is redrawn in Fig. 2 on a larger size and adjusted in printing so that the radius is 25 eighths of an inch long. Each eighth of an inch then represents a daily journey of 1000 miles or a speed of 1000 miles a day. Such a scale is drawn at the bottom of the quarter-circle, and is labeled "Scale 1." We can use Fig. 2 in at least two ways to get the daily speed. Take, for example, Merida, Yucatan, which is about 21°N. Plot the point, M, at the 21° point on the circle, and drop the line, MY, perpendicular to the radius of the equator, CQ, and cutting it at the point Y. Y falls on the scale at the point corresponding to 23,300, so we find that Merida has a speed of 23,300 miles a day on account of the earth's rotation. A second method amounts to the same thing, and may be illustrated by Denver, which is in about 40° N. Lat. At the 40° point on the quarter-circle plot the point, D, and from it drop a perpendicular, DX, to NC representing the axis of the earth, and cutting it at X. With a pair of dividers, or by marking off its length on a strip of paper, apply the length of DX to the scale and find it to be about 19 1/5 spaces long. This means that the speed of Denver due to the earth's rotation is about 19,200 miles a day. If one measures the length of DX with a ruler one will find it to be a trifle over 2 3/8 inches long. But 2 3/8 inches is 19/8 inches. The second method can be modified by using a ruler directly and calculating the number of eighths of an inch. This may be illustrated by another example, Tromsoe, nearly 70° north of the equator in Norway. The 70° point on the quarter-circle is marked T. Its distance from the line NC is about one and one-eighth inches, or nine eighths

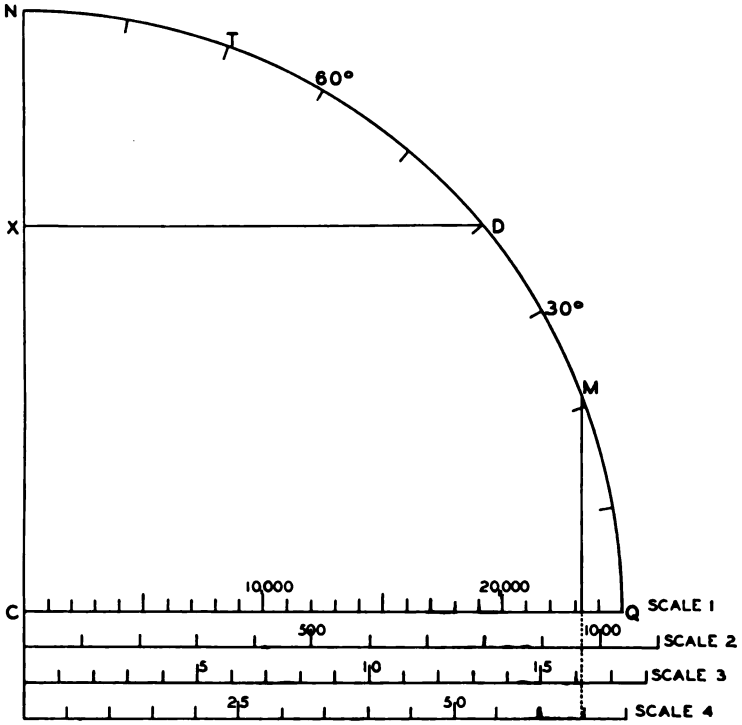

FIG. 2

of an inch. This means that the earth's rotation moves Tromsoe with a speed of 9,000 miles a day.

Below the main part of Fig. 2 are three additional scales, besides Scale 1 which was used above. Scale 2 is divided so that the earth's radius contains 10 2/5 spaces, each of which represents a speed of 100 miles an hour. The line MY, for Merida, when extended cuts Scale 2 at the point corresponding to 970 miles an hour, another expression for Merida's rotational speed. We could read on the same scale that Denver's speed is about 800 miles an hour.

The divisions of Scale 3 are such that 17 1/3 units just equal the length of the equator, and each unit represents a speed of one mile a minute. If we extend MY it cuts Scale 3 at about 16 1/5, which means that Merida moves with a speed of 16 1/5 miles a minute because of the earth's rotation. Applying the length DX to this scale we find Denver's speed to be about 13 1/3 miles a minute.

LENGTHS OF DEGREES OF LONGITUDE

Scale 4 has a quite different purpose, namely, that of calculating the length of a degree of longitude in any latitude. A degree of longitude is 1/360 of the length of the whole parallel of which it is a part. Since the parallels decrease in size from the equator to the poles, the lengths of degrees of longitude must also decrease. At the equator, a degree of longitude is 1/360 of 25,000 miles or 69.4 miles. A degree of longitude along the 60th parallel is just half as long since the circumference of the 60th parallel is just half the circumference of the equator. Like relations prevail for other latitudes. Scale 4 is divided so that 69.4 units have the same length as CQ, but, to avoid crowding, only every fifth unit is plotted. Continuing MY down to Scale 4, we find that a degree of longitude in the latitude of Merida has a length of almost 65 miles. Applying the length of DX to Scale 4, we find that a degree of longitude is about 53 miles long in the latitude of Denver.

It will have occurred to the reader that we have gone on two assumptions that are actually erroneous. In the first place the circumference of the earth is less by about 100 miles than the 25,000 assumed. This would make an error of about one-half of one per cent. In the second place the earth is not a perfect sphere as assumed, which introduces errors that are not easily evaluated. It is believed, however, that the limitations of drafting and measuring on the small scale of the present Fig. 2, make it undesirable to go to the additional trouble necessary to eliminate the two sources of error. Most playing cards are about 1/100 inch thick. Put your pencil down on Fig. 2 a point away from the proper point by a distance of 1/100 inch, and you will be out the equivalent of 80 miles. Do we need to worry about assuming the girth of the earth to be 25,000 instead of 24,902 miles? Similarly for the oblate shape. In drafting the arc was made as nearly a perfect quarter-circle of 3 1/8 inches radius as possible. To allow for the oblateness, the north point should have been moved toward the center a distance of 1/100 inch. Is it a serious error? No. Probably more serious inaccuracies have been produced in the drafting.

Fig. 2 is, of course, equally applicable to points in the southern hemisphere. Thus, MY, which was drawn for Merida in 20° north latitude, would serve for a Mackay, Australia, in 21° south latitude. Likewise, DX, drawn for Denver in 40° north latitude, does fairly well for Valdivia, Chile, which is close to 40° south latitude.

THE SYRACUSE MEETING OF THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

W. J. BERRY, SECRETARY

The 1936 conference of the National Council of Geography Teachers was held at Syracuse, N.Y., on December 29 and 30, 1936. Interest in all the sessions was high and the attendance was about as usual despite the fact that other educational conferences kept many New York educators from being present at the Council sessions.

The program arranged by President Alison E. Aitchison was especially praiseworthy. It presented a good selection of papers both in technique of geographic instruction and in reports of geographic research. Especially noteworthy was the report of the Committee on Geography Tests which was selected in 1935 by the National Council of Geography Teachers for construction of geography tests for publication by the National Council.

The session of Tuesday morning was general in nature, as shown by the titles: Geography of the Syracuse Region, by Sidman P. Poole; You and Your Natural Environment, by Cora P. Sletten, and Geography Requirements for State Certification of Teachers, by Isabelle K. Hart. Mrs. Hart's study is to be continued for reporting at a later date.

A special feature of Tuesday was a field trip conducted by Dr. Poole at the noon intermission.

The program of Tuesday afternoon may be considered the outstanding session of the conference from the standpoint of purely educational geography, it being given over exclusively to geographic testing. Techniques in geographic testing at elementary levels were presented by Dr. F. E. Lord; testing at college level was discussed by Dr. Ralph H. Brown. Dr. Harry P. Smith, College of Education, Syracuse University, pointed out major objectives, special values, and some limitations of standardized tests. Of special significance at this session was the progress report, given by Marguerite Uttley, on the geography tests being constructed by a special committee of the National Council. Miss Uttley outlined the bases upon which the tests are being built, described methods of procedure, and reported the present status of the work.

At the evening session the Council was favored with an entertaining and instructive account, by Dr. Robert S. Platt, of first-hand experiences on an Amazonian traverse.

The sessions of Wednesday were particularly strong. In his paper, Attributes of Place, Dr. Elmer W. Ekblaw reemphasized an attractive philosophy of geography. City studies were presented by Martha E. Norburn and Margaret Parker. Dr. Alice Foster interpreted for the Council the personality of the Guayaquil Lowland and Dr. Marie Bentivoglio ably showed how manufacturing in Italy has been superimposed upon the rural pattern with but a slight shift in population.

The program of Wednesday afternoon was devoted to conservation, a field of investigation in which President Aitchison has been actively interested for many years. Nora Zink discussed the subject from a regional point of view. Dr. Helen M. Strong of the Soils Conservation Service discussed the conservation of soils. Gilbert White of the National Water Resources Committee outlined some major objectives and achievements in national planning of water resources. George A. Duthie of the Forest Service outlined the wealth of material available on forest conservation and urged the need of stimulating interest in the schools for forest conservation.

The address following the annual banquet was given by Dr. Derwent S. Whittlesey of Harvard. Dr. Whittlesey explained at length how the historical background is reflected in the political pattern of West Africa, an area which he is especially qualified to discuss because of extensive library investigations and recent field studies in the area.

At the annual banquet the Distinguished Service Award of the National Council of Geography Teachers was conferred upon Isaiah Bowman, President of Johns Hopkins University, in recognition of his many contributions to educational geography.

BUSINESS MEETINGS, 1936

The annual business meeting of the Board of Directors and Executive Committee of the National Council of Geography Teachers was held in two sessions, the first occurring at 8:00 P.M., December 28 at room 522, Hotel Syracuse in Syracuse, N.Y., and the second at the same place on December 30.

At the first session the following business was transacted:

1. The meeting was called to order by President Alison E. Aitchison.
2. The minutes of the 1935 meeting were read by the secretary and approved with one correction.
3. President Aitchison presented briefly the proposition that the Board might well adopt the policy of each year choosing a definite field of investigation.
4. Miss Kathryn Roberts of Cortland, New York, presented for the New York

State Geographical Association, information relative to some pending curricula revisions which were considered a definite danger to geographic education.

5. It was moved and seconded that a committee be chosen to formulate a resolution setting forth statements relative to the contributions and uses of geographic study. The motion was approved.
6. President Aitchison presented the subject of high school geography as a possibility for study by the National Council of Geography Teachers. However, the lateness of the hour prevented discussion and the meeting was adjourned with no formal action on the subject having been taken.

At the second session of the meeting the following business was transacted:

1. The meeting was called to order by the president.
2. The treasurer's report was read by Treasurer H. Harrison Russell. The report indicated that there had been a slight increase in the amount in the treasury despite the outlay for Professional Paper No. 4.
3. Mr. George J. Miller presented the report of the Special Committee appointed to draft a statement of the contributions of geography to education. After several suggestions were made for the consideration of the committee the report was approved. Members of the Board volunteered to send Mr. Miller names and addresses of individuals and of boards who might be interested in receiving the report of the committee.
4. The report of the Nominating Committee consisting of Edna Eisen, J. E. Switzer and Cora P. Sletten, chairman, was presented by the chairman and the following were chosen as officers for the National Council for 1937:

   President, Earl E. Lackey
   First Vice-President, J. Russell Whitaker
   Second Vice-President, Lucia C. Harrison
   Secretary, Floyd Cunningham
   Treasurer, H. Harrison Russell
   Executive Committee: (term to expire in 1939) Alison E. Aitchison, Erna Grassmuck Gilland and DeForest Stull
   Distinguished Service Award Committee: (term to expire in 1941) Edith P. Parker
   Directors at Large: (one year only) David Olson, Thomas F. Barton, Alice Foster and Ida May Shrode
5. At this juncture two letters were read by the Secretary, the first from George J. Miller announcing the publication of Volume No. 4 of Geographic Education Series, entitled, "Activities in Geography," and the second from A. E. Parkins and J. R. Whitaker in which the editors and authors of "Our Natural Resources and Their Conservation," offer to donate equally to the National Council of Geography Teachers and the Association of American Geographers the royalties derived from the sales of the book.
6. It was moved, seconded and approved that the National Council of Geography Teachers accept the offer of editors Parkins and Whitaker and the contributing authors. It was moved, seconded and approved that the Secretary be instructed to convey to Drs. Parkins and Whitaker the sincere thanks of the National Council of Geography Teachers for their very generous gift to the Council of half the royalties to be derived from the sale of "Our Natural Resources and Their Conservation."
7. It was moved, seconded and approved that the National Council express to Mr. Miller its appreciation for his efforts in preparing the volumes of The Geographic Education Series and that the expense incurred in preparing "Activities in Geography," $7.50, be paid him from the treasury.
8. In the absence of Mrs. Gilland, President Aitchison presented the report of the

Educational Relations Committee on the geography section of the summer N.E.A. meeting.

9. It was moved, seconded and carried that Mrs. Gilland be reimbursed to the extent of $10.00 for expenses connected with publicity for geography conferences.
10. It was moved and seconded that the incoming President and Secretary be empowered to choose the time and place of the 1937 meeting. Carried.
11. It was moved and seconded that the Council send $25.00 annual dues to the World Federation of Education Associations. Carried.
12. The report of the Resolutions Committee was read by Chairman Robert M. Brown.

The National Council of Geography Teachers assembled at Hotel Syracuse, Syracuse, N.Y., December 29 and 30, 1936, present the following resolution:

1. That the appreciation of the Council be extended to the Department of Geology and Geography of Syracuse University for the careful attention to detail, including student help, lantern, and facilities for display of maps, which made our stay in Syracuse pleasant and profitable.
2. That the thanks of the Council be extended to the management of Hotel Syracuse for meeting and lounging space.
3. That the gratitude of the Council be extended to the Department of Geology and Geography of Syracuse University and to the New York Geographical Association for entertaining the Council at reception and tea.

CHRISTINE HAHN
HENRY F. BECKER
ROBERT M. BROWN, *Chairman*

13. Adjournment

THE DISTINGUISHED SERVICE AWARD

ALICE FOSTER
Committee Chairman

At the Syracuse meeting of the National Council of Geography Teachers the Distinguished Service Award was conferred upon President Isaiah Bowman of the Johns Hopkins University in recognition of leadership in geographic education exerted over a quarter of a century, and in appreciation of a specific service rendered at a critical time.

The following points indicate Dr. Bowman's leadership in geographic education during a period when the subject was undergoing transition to its present form:

1. Numerous geographic articles published in the decade before the World War indicate his pioneer work in the "humanizing of geography," a change which the educational world was pleading for at that time;
2. He showed an early interest in geographic education by acting as contributing editor of the JOURNAL OF GEOGRAPHY from 1907 to 1918;
3. He contributed much to geographic education at an adult level thru his distinguished work as Director of the American Geographical Society;
4. Thru the scholarly works which give the results of his research and exploration, he has made a valuable addition to the literature available for studying the little-known parts of the world;
5. Thru the timely publication of "The New World," made possible by his work in connection with the Peace Conference, he facilitated greatly the teaching of geography during the early post-war period;
6. The preparation of the one-to-a-million map of Hispanic America, undertaken by the American Geographical Society under his directorship, represents an invaluable contribution to the material available for geographic education;
7. His services as president of the International Geographical Union from 1931 to 1934 and as vice-president since 1934 testify to an interest in geographic education extending beyond national boundaries;
8. He rendered valuable services to geographic education as a member of the Krey Commission, particularly thru the monumental volume, "Geography in Relation to the Social Sciences," which he contributed to the report of the commission.

The specific service recognized in the award was rendered soon after the close of the World War. Then Dr. Bowman's clear vision and generous action at an opportune time gave the National Council an official organ of publication. In 1918 the American Geographical Society under Dr. Bowman's directorship made arrangements whereby it assumed ownership of the JOURNAL OF GEOGRAPHY, which up to that time had been under personal management and control. During 1919 the JOURNAL for the first time was published as the official organ of the National Council of Geography Teachers, then some five years old. This changed status came about at the suggestion of Isaiah Bowman, whose name appears on the title page of the 1919 volume as editor. In 1920 the National Council took control of the JOURNAL, the American Geographical Society having given the magazine new prestige thru association with a strong scientific organization, and having given to the National Council, without monetary compensation, a well-established magazine as its official organ.

President Bowman, compelled to be absent from the annual dinner of the National Council because of a speaking engagement elsewhere, sent the following message in response to the letter informing him of the action of the Award Committee.

To the National Council of Geography Teachers:

I appreciate deeply the kindness and generosity of the National Council in selecting me for an award this year. Tho I have not been a classroom teacher since 1915 I have always kept in vivid memory my fifteen years' experience as a teacher and my interest in the profession.

Permit me to take this opportunity of expressing my sincere regard for the National Council of Geography Teachers and my appreciation of the work it is doing. My belief is that the most intense concentration upon specific forms of endeavor, especially in the field of research, will do more to place geography in an acceptable and strong position in the schools than anything else I can think of. Teaching that is not related to research is bound in the end to be formalized and barren. The textbook is a most useful adjunct to teaching. It is indispensable that someone should give attention to the organization of material for teachers who are not qualified to obtain it or who do not have access to good library facilities. But teaching needs also to have constant revitalization thru discovery in new fields. And discovery comes by painful effort and intense concentration and cultivation.

In accepting your award and thanking you for it I beg to express the hope that the National Council of Geography Teachers will reach higher and higher standards of teaching and that it will never consent to look upon teaching as something apart from research but, rather, that teaching and research shall be regarded as the right and left hands of the educational process.

Sincerely yours,

ISAIAH BOWMAN

EDITORIAL NOTES AND NEWS

A new bridge is not merely a crossing place over a body of water, but its great length, height, cost, beauty, its reflection of engineering skill and workmanship in triumphing over what was long thought to be unsurmountable difficulties, may be drawing cards for thousands who see it in the progress of building, witness its completion, or participate in the festivities arranged around it. Such is the case of the new San Francisco-Oakland Bridge whose recent dedication is reported to have brought into the cities so many visitors as to tax to their fullest capacity the hotels, restaurants, amusement places, and transportation agencies. And no wonder, for the project, a series of bridges and elevated highways, is eight and a fourth miles long, four and one half miles directly over water. Starting from street levels in San Francisco the motorist drives onto a ramp leading to the high Bay bridge, actually two suspension bridges, which extends to Yerba Buena Island where the roadway is tunnelled thru a hill. From there a cantilever bridge over East Bay and a viaduct lead down to the streets of Oakland. The bridge's top deck has six lanes for automobiles and is equipped for night driving with sodium vapor lamps. Pedestrians are not allowed. Later a lower deck will be provided with truck and bus lanes and interurban tracks. The convenience and saving of time over that of ferry travel, in spite of tolls, is expected to lead to some new alignments in the location of some industries and residences. Near this bridge, another bridge, the Golden Gate Bridge, is nearing completion. Both will play a large part in attracting visitors to the Golden Gate International Exposition of 1939. Staged on a built-to-order island in the Bay, the exposition will be dedicated to transportation and communication, a pageant of the Pacific. Later, the island is expected to become an air terminal for transcontinental and trans-Pacific skyways.

According to a recent release from the U. S. Department of Agriculture, the United States fur trade paid more than two million dollars for three types of fur, all of which came from Karakul sheep. The Soviet Union leads in this production, followed by Southwest Africa, and Rumania. A few purebred Karakul sheep were brought into the United States from their native home in Central Asia, in 1909, 1913, and 1914. Further importations have been restricted due to quarantine regulations; hence our small production of pelts. To meet this limited production, the Department has been crossing purebred Karakul rams with Blackface Highland and Corriedale ewes. These crosses are producing pelts comparatively high in quality. "Broadtail" is produced usually from pre-maturely born lambs and is a flat, lightweight, lustrous fur with a water-wave pattern. All the maturely born lambs a few days old have a tight, lustrous curl, such skins becoming the "Persian lamb" of the fur market, next in value to Broadtail. Lambs soon lose their tight curls, but their skins retain a wavy moire pattern for a few weeks which in trade is known as "caracul." Karakul sheep are able to thrive under adverse conditions, but the wool of the mature animal is coarse, and hence limited in use. Fur specialists say that the greatest drawback to commercial production of Karakul sheep lies in the instability of the market due to the whimsies of the style creators.

An interesting account of the evolution of territorial and county boundary lines has been brought out in the case of Utah by a W.P.A. project. The findings of the survey are summarized by Dr. George A. Hansen, Professor of Geology, Brigham Young University, in a publication entitled, "A Map History of the State of Utah." The boundary changes are shown on maps bearing pictorial representations of mountains, cliffs, and rivers. The object of the project was to bring out the mistakes of the past with the hope that future redistricting of the state will be made by specialists, not by politicians, and will be in accord with topography and natural drainage lines.

Briefly, the Mormons claimed a vast territory surrounding the present state of Utah, with an outlet to the Pacific in Southern California. Recognizing a need for administrative units they divided the part near Salt Lake in which settlements had been made into six counties each of which roughly corresponded with a small valley delimited by natural barriers. When the territory was officially created, these counties were expanded into belts extending hundreds of miles east and west, and similar subdivisions were made of the remainder of the territory. Presumably the lack of knowledge of this unexplored area precluded the use of natural boundaries, and led instead to the use of meridians and parallels. Many boundary changes have since transpired, but the state still has only 45 per cent of its counties delimited by natural boundaries. Consolidations should be effected to permit a saving in costs of local government. It will be interesting to see how much of a stumbling block politics will play in the redistricting of the state following this survey.

More than 700 people attended the October program of the Geography Club of Western Pennsylvania held at Pittsburgh. A symposium on Secondary School Geography was presented by Dr. J. Freeman Guy, First Associate Superintendent, Pittsburgh Public Schools; C. A. Kuhner, head of the geography department, Clarion State Teachers College; Dr. James N. Rule, Principal Langley High School, Pittsburgh; and Jessie Whitehill, Gladstone High School, Pittsburgh. Dr. Wallace W. Atwood, President of Clark University, was the guest speaker, with an address on The New Meaning of Geography in American Education.

DR. GEORGE B. CRESSEY of Syracuse University delivered a lecture at the Pennsylvania State College on October 19, "The Chinese Landscape." The lecture was sponsored by the Geology and Geography Department.

To stimulate research in the field they so ably serve, the editors of and contributors to "Our Natural Resources and Their Conservation" have relinquished their personal rights to royalties accruing from the sale of this publication and have instead delegated one-half of the royalties to the Research Fund of the National Council of Geography Teachers and the other half to a similar fund of the Association of American Geographers. The National Council accepts this gift with sincere appreciation of the vast amount of research these editors and contributors carried on in the preparation of this outstanding contribution to conservation. Surely each member of the Council must feel some personal satisfaction in belonging to an organization which has already made outstanding contributions to the teaching of geography, and at the same time is accumulating a fund that will promote further research in geographic education.

High school geography teachers may be interested in a series of articles on the organization, contents and methods of teaching economic geography, appearing in *The Business Education World*. Dr. Douglas C. Ridgley is the editor of the series and the contributor of the second article, "The Study of Commodities," published in October. Other contributions and their authors are as follows: September, The Function of Geography, Dr. W. Elmer Ekblaw; November, How We Teach Economic Geography, Clare Symonds; December, A Lesson Plan for Teaching Wheat in a High School Course in Economic Geography, William R. Weaver; January, Cotton: The World's Leading Textile Crop, Dr. William T. Chambers; February, The Climatic Factor in Economic Geography, John C. Parsons; March, Economic Geography of the Grasslands, Dr. Sidney E. Ekblaw; April, Present Needs and Tendencies in the Conservation of Our Natural Resources, Richard J. Preston; May, Economic Geography as a Factor in Social Business Education, Dr. Harry O. Lathrop; June, Geography in the Senior High School, George J. Miller.

LOUISE W. MEARS, department of geography, Milwaukee State Teachers College, spent the Christmas holidays on a cruise in the Bahama Islands. For a number of years Miss Mears has been making a study of tropical islands, gathering first-hand material for a college course, "Tropical Islands of the World."

A contribution of great value to students of Latin American countries is the new Handbook of Latin American Studies, edited by Lewis Hanke, and published by the Harvard University Press, 1936. It is the outgrowth of a conference sponsored in 1935 by the Social Science Research Council which was attended by representatives from nine universities, the Library of Congress, and the American Geographical Society. The purpose of the conference was to enable specialists in the field of anthropology, archaeology, economics, geography, history, law, and literature to meet and to coordinate the achievements in their respective fields and thereby facilitate research in Latin American culture. The outgrowth of this meeting was the Handbook, made possible by generous financial assistance from the American Council of Learned Societies, and the efforts of many friends and organizations. It provides an annual record of important publications in the various fields mentioned above, with annotations and prefatory notes by the contributing editor in charge of each section. Future annual editions will be expanded to carry a number of special articles.

According to a release from the U. S. Department of Commerce, approximately $10,000,000 worth of Christmas trees are sold annually in the United States. From two to four million trees come from Canada. In scientific practices of forestry this cutting is a wise measure.

According to a recent release from the U. S. Department of the Interior, Chilean placer-gold production has been stimulated by a recent ruling of the Chilean International Exchange Commission authorizing the importation of luxuries (automobiles, radios, etc.) provided they were paid for with washed gold. The production in August was 82.6 kilos (a kilogram is 2.20 pounds) whereas in October it was 292.9 kilos. Placer mining had its first stimulus in 1931 when the Government sponsored it as an aid to unemployment. The output has increased from 270 kilos in 1932 to 2,234 kilos in 1934. Gold quartz mining has also increased. The total gold production from all mining operations totaled 4,583 kilos in 1933, 7,392 kilos in 1934, and 8,224 kilos in 1935.

HERBERT C. HANSON, State College Station, Fargo, North Dakota, one of the contributors to "Our Natural Resources and their Conservation," is the editor of *The Ranger*, a monthly publication dealing with recent developments in range and pasture management, wild life management, soil conservation, and related fields.

GEOGRAPHICAL PUBLICATIONS

Mark Jefferson. **Man in Europe**, 259+VIII pp., 99 illustrations. Published by the author and printed at Ypsilanti, Michigan. 1936. $2.50.

This book (a revision) is a brief geography of Europe in which a workbook has been incorporated. The contents can probably best be presented by listing the titles of the nine chapters: Europe the Leading Continent; Distribution of Population; Cities; Wealth; What the European Is Like; Climate; Vegetation Provinces; Pictures and Questions; Content of the Northern Plains.

There is much informality about the book. The style is chatty, thought stimulating, pithy, just what we have come to expect from "the Bernard Shaw of American geographers." The students and teacher are made to feel at home with each other.

It is a book to be studied, not merely read. In the preface the author tells us the book is prepared for use in the preparation of teachers. "It aims not to tell what the reader can work out for himself." This is a Mark Jeffersonian principle of teaching thoroly in line with the best in present-day philosophy of education.

Jefferson seems to be firmly of the belief that pictures in books are there for edification, not for mere illustration. He presents sixty pictures, halftones from his own negatives. These are carefully selected to illustrate some features of geography from the "top of Norway" to the Mediterranean and even beyond into Algeria. Each is an intimate presentation of the behavior of the people.

The author does not set up some hypothetical definition of geography which he strains to follow and bedevils all those who fail to agree with this particular definition. In his preface he says, "I have no mandates to define geography; but I want children to know where some of the more important people of the world are and what they are like, and I first want the teachers to know these things themselves." This is the keynote of his presentation.

One will find in the book several things that are new as one always expects in any product from the pen of Professor Jefferson.

A. E. Parkens

George Peabody College
for Teachers

C. Langdon White and George T. Renner. **Geography, An Introduction to Human Ecology.** 756 pages. Numerous illustrations, maps and charts. D. Appleton-Century Company, New York. 1936. $4.00.

This book is one of The Century Earth Science Series edited by Kirtley F. Mather. It is written in an orderly manner, thoroly scientific, and presents the elements of geography in a manner suitable for college or normal school introductory work in geography. The main headings indicate that the emphasis might be placed upon the various elements of the natural environment, but such is not the case. The various elements of the natural environment are taken up in turn, and the authors show how man has reacted to these elements—in fact the major emphasis is placed upon man.

The text is divided into ten parts, the first of which gives a survey of the whole field of geography and includes the authors' point of view as that of the human geographer. The major portion of the book takes up the several geographic elements, namely: Climatic, Biotic, Physiographic, Edaphic (Soil), Mineral, Hydrographic, Spatial, and attempts to evaluate the influence each element exerts on the life of man. Concluding chapters deal with the Region, Field Work, and Man as a Factor in Geography.

Tho there are now several other texts in introductory college geography, White and

Renner have made a distinct contribution in reducing geography to a science. In this the book is outstanding.

The text has as subtitle, "An Introduction to Human Ecology," and applies the nomenclature and terminology of the science of ecology to geography thruout. Tho this parallel strengthens the work, it is perhaps unfortunate because of the lack of knowledge of ecology on the part of many beginning college students and the confusion that might follow in the attempt to liken and apply the principles of one science to another.

Geography, An Introduction to Human Ecology, is perhaps the greatest recent contribution to textbook writing in college geography.

BERT HUDGINS

Wayne University
Detroit, Michigan

Grover Clark. The Balance Sheets of Imperialism: Facts and Figures on Colonies. 136 pp., tables, appendices, and bibliography. Columbia University Press, New York, 1936. $2.75.

The Balance Sheets of Imperialism, as the name implies, consists largely of many pages of facts and figures on the finances of the colonies of England, France, Germany, Italy, and Japan; and of only 19 pages of text. The figures speak for themselves, and provide the data for the textual material on "Conclusions from the Evidence," which, interestingly enough, is placed in front of the tables.

In the text, the author outlines the claims as to the value of colonies under three heads: (1) that they provide important outlets for population, (2) that their possession gives important opportunities for trade, and (3) that control of the resources in colonies provides national security in times of peace, and advantages in times of war; and then proves by means of the attached "balance sheets" that each claim is fallacious. Prior to 1880, the profits to private concerns about equaled the government losses in colonies, but since that date the cash costs of owning and governing colonies have been much greater than the cash profits derived from trade with controlled territories. The territorial expansions of both Italy and Germany, largely since 1880, have been financial losses. In the intense struggle for colonies (largely Africa) in the latter part of last century, many active rivalries were begun in Europe that ultimately led to the World War. European nationals have not been attracted to European colonies as they have to other territories. The statement that, "in 1931 there were less than half as many Europeans of all nationalities in the Italian colonies as there were Italians on the island of Manhattan in New York," shows conclusively that ownership of colonial territory does not influence many nationals of the owning country. In conclusion the author states that "the case against the old colonial system is damningly clear," and that the old order must soon change. He sees some hope in the mandate control of a territory, provided the preferred rating of the controlling nation is eliminated in favor of equal opportunity to all nations for trade.

This interesting little volume provides, in its tables, data that have been scattered thru government reports, and here assembled for the first time under one cover. These data should be of value to both the geographer and the historian. The appendices on (1) the political status of colonized territories, and (2) the principal treaties relating to colonies, provide a convenient reference list for the busy teacher. The elaborate bibliography is particularly helpful in furnishing a list of government publications of the principal nations of the world, as well as the leading source materials on these same countries.

EDWIN J. FOSCUE

Southern Methodist University

Wisconsin, Regional Plan Report, 1934. 501 pp. Illustrated. Wisconsin Regional Planning Committee, Madison. 1936

This first report of the Wisconsin Planning Committee, aided by the National Resources Board and other federal and state agencies, analyzes and synthesizes the economic assets and natural resources of the state to the end that this may aid in the furtherance of plans for the orderly development of the state and its governmental agencies. These chapter headings indicate the scope of the work: Geographic Background, Population, Education, Health, Recreation, Water Resources, Mineral Resources, Conservation, Planning, Industry, Electric Power, Transport, Public Works, and Government and Taxation. The clear cut grafs and excellent maps are an outstanding feature of the report. Some of the maps included are by Guy-Harold Smith, Loyal Durand, Jr., and the Board of Engineers for Rivers and Harbors, U. S. War Department. Statistical data is from a great variety of private as well as state and federal organizations. Bringing together this vast amount of scientific material from so many excellent sources and presenting it in such an effective and easily comprehensible form cannot fail to be a noteworthy forward step in the wise use of Wisconsin's resources, and stimulate similar programs in other states.

Cora P. Sletten

John Bartholomew (Editor). **The Oxford Advanced Atlas.** 5th Ed. 96 pp. of maps, 32 pp. (3 cols.) of general index. The Oxford University Press, N.Y. 1936. $3.50

This is a complete revision of a well known atlas and comment on its high quality is not necessary. The size of the page has been increased so that the numerous double-page maps now measure approximately 20" x 14¾". New features include a morphology map of Europe; population map of the British Isles; new treatment, largely by double-page maps, of Spain and Portugal, Balkans, Soviet Union, Central and East Africa, South Africa, and Laurentic Basin; contoured maps of the Atlantic and Pacific oceans.

Webster's Collegiate Dictionary. 5th Ed. 1300 pp., 1800 ill., 110,000 entries. Indexed. G. & C. Merriam Co., Springfield, Mass. 1936. $3.50 to $8.50

An abridgment of Webster's New International Dictionary which has been the standard for many years. Altho a very large amount of material is included the volume is a handy size for desk use—thin paper being used. The supplementary material includes, Abbreviations, Arbitrary Signs and Symbols, Gazetteer, Biographical Dictionary, Christian Names, and Vocabulary of Rhymes. A truly remarkable volume considering its small size and low cost.

Erich von Drygalski and others. **Amerikanische Landschaft.** 8" x 10¾", 532 pp., 100 maps, diagrams, photos. Walter de Gruyter & Co., Berlin. 1936. RM 26.

This large volume consists of an introduction by Dr. von Drygalski and five essays on selected regions, each being an independent treatise. Ozarkland is given 128 pages by Rudolf Schottenloher; Kanadische Prärie, 101 pages by Max Eichmeier; Florida, 115 pages by Peter Berger; Jamaica, 113 pages by Wilhelm Küchler; and Seattle, 72 pages by Homer L. Seeger. A selected bibliography accompanies each paper.

NEW PUBLICATIONS

Atlas of the Tennessee Valley Region. Part 1, The Natural Series. Submitted by G. Donald Hudson. 19 pp.+12 cartographic charts. Land Classification Section, Division of Land Planning and Housing, Tennessee Valley Authority, Knoxville, Tennessee. 1936

Each of these excellent maps is accompanied by a brief text drawing attention to the salient facts brought out by the mapping. Section one has an individual map for each of these factors: physiography (based on A. K. Lobeck's diagram), soils, erosion conditions, and forest regions. Section two has eight maps, each one featuring some climatic element, as well as a chart showing more than a hundred individual station grafs selected to give a fairly accurate areal distribution of precipitation, temperature, and wind direction. A population distribution map concludes the set. The Atlas will be augmented by other series of maps as soon as released, such as the forthcoming Industrial Series. Others will depict analyses of land-use items, population, land values, and income.

Richard M. Field. **Natural Resources of the United States.** 203 pp. Illustrated. Barnes and Noble, Inc., N.Y. 1936. 75 cents.

One of the College Outline Series. A handbook especially valuable for quick reference and review. A bibliography is included.

Ernest R. Lilley. **Economic Geology of Mineral Deposits.** 811 pp. Illustrated. Henry Holt and Co. Inc., N.Y. 1936. $5.00

An exposition of the geologic form, structure, extent and distribution of mineral deposits, and the chemical and physical properties of rocks and minerals correlated with the economic utilization of mineral resources and the consideration of the commercial, industrial and political problems associated with the demand for mineral substances.

Leila Gott Harris and Kilroy Harris. **It Happened in South Africa.** 191 pp. **It Happened in Australia.** 173 pp. Illustrated. McKnight and McKnight, Bloomington, Ill. 1936. Each 75 cents.

Supplementary material, gleaned from personal contacts with the scenes and incidents described, covering present economic development and living conditions, as well as brief references to the past.

C. Langdon White and George T. Renner. **Geography, An Introduction to Human Ecology.** 790 pp. Illustrated. D. Appleton-Century Co., N.Y. 1936. $4.00

The authors devote separate chapters to a comprehensive discussion of each of the various elements of the natural environment together with man's reactions to them and an evaluation of the reaction. Then the elements are synthesized in a regional treatment of certain specific areas, with a chapter on the significance and methodology of field work, and one on man as a factor in geography. The book is one of the Century Earth Science Series, Kirtley T. Mather, Editor.

Frances Carpenter. **Our Little Friends of Norway, Ola and Marit.** 213 pp. Illustrated. American Book Company, Boston. 1936

One of a series of home-life supplementary readers for the lower grades; an excellent sympathetic understanding of the life of two fiord farm children at home, at school, and at places visited in various parts of Norway.

Griffith Taylor. **Environment and Nation: Geographical Factors in the Cultural and Political History of Europe.** 571 pp. Illustrated. University of Chicago Press, Chicago, Ill. 1936. $4.00

An analysis of the cultural development of nations and the nations' spread over Europe as related to the natural landscape, especially the topographic and climatic features, to the end that man-made prejudices may be swept aside, and that each nation may learn that its rank in the world is in proportion to its cultural and economic status, not its prejudices of race, language and religion. The book is a sequel to the author's Environment and Race, to be followed by Environment and Settlement, dealing with smaller units of settlement than the preceding.

The Winston Simplified Dictionary for Schools. Edited by Thomas Kite Brown and William Dodge Lewis. 950 pp., 10 color plates, 24 maps in color. John C. Winston Co., Philadelphia. 1936. $1.28

A new feature is the inclusion of all place names in the main word list where, in addition to the foreign form of the word and the information on the place, reference is made to a specific plate in the map section bearing the place name. The main list also includes abbreviations and those foreign words commonly used in English writing.

Gordon East. **An Historical Geography of Europe.** 480 pp. Illustrated. E. P. Dutton and Co., Inc., N.Y. 1935. $5.00

A geographic interpretation of the development of European nations, beginning with the Roman Empire and containing thru the nineteenth century. Part I emphasizes the agricultural pattern, particularly its field systems, varieties and distribution of crops, and the attempts to get woodland, marsh and heath into tilled fields; and the distribution and localization of industry, commerce, and transportation. Part II outlines the territorial evolution of a number of modern states including résumés of former empires bordering the Mediterranean.

Course of Study in Geography for Grades IV, V, VI, VII. Prepared by the Florida Council of Geography Teachers, under the supervision of H. F. Becker and Gladys Fawley. 154 pp. State Department of Public Instruction, Tallahassee. 50 cents + 10 cents postage.

The basic principles underlying the course are in accord with those embodied in the Thirty-second Yearbook of the National Society for the Study of Education. The outline for each grade is organized in a series of teaching units with directions for attaining certain major understandings from the regional studies selected, along with certain specific abilities, skills, and habits.

John R. Stewart. **Manchuria Since 1931.** Secretariat Papers No. 2. 53 pp. Secretariat, Institute of Pacific Relations, Publications Office, 129 East 52nd Street, New York. 1936. 25 cents

Prepared for the Sixth Conference of the Institute of Pacific Relations, held at Yosemite Park, California, August 15-29, 1936.

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THE PLAINS OF THE PO

W. O. BLANCHARD
University of Illinois

A HIGHLY FAVORED REGION

In the beauty of their setting and in the productiveness of their farms and factories, the plains of the Po have few equals. Here is to be found that ideal combination of a highly favorable environment and an unusually energetic people, a combination rare enough the world over, but more especially lacking in the Mediterranean Basin.

Even within Italy itself, this favored region is in marked contrast to the rest of the country. Politically it is, of course, a part of the Kingdom, but geographically, it is a different land—different in its surface, its soils, its climate, its power resources, and in the type of people who have made it their home. It is withal, a prosperous and densely populated region in a country which, for the most part, is poorly endowed. It is not to be wondered at, then, that altho Roma (Rome), the older city, on its seven hills, has remained the political and religious capital, Milano (Milan), the newer metropolis of the plains, has come to be the commercial and industrial nerve center of Italy.

ADVANTAGES OF A LEVEL SURFACE

That it is level instead of mountainous, like the regions about it, is the Po Basin's chief asset, and one for which it may thank the accidents of geologic history. In the recent past, geologically speaking, this section was a shallow extension of the Adriatic—a sort of gulf girded about by the Alps and Apennines. A slight uplift of the sea bottom together with an enormous amount of filling in of waste from the surrounding mountains transformed it into a plain. The surface is, for the most part, level or gently rolling and so low that a rise of 300 feet in the ocean level would restore most of it to the Adriatic. From west to east the plain extends about 250 miles; in width it varies from 50 miles in Piedmont to 120 miles at the delta. It is the largest European plain in the entire Mediterranean Basin, with an area somewhat greater than Switzerland. See map, Fig. 1.

In addition to the fertile waste they contributed, the encircling mountains have in other ways been important factors in the development of the plains. Their rivers which for thousands of years filled the sea to make the lowland now supply those same lands with water for both irrigation and power. Some of these Alpine valleys were dammed by glacial moraines, and transformed into great reservoirs—the beautiful Italian lakes (see Fig 2). These not only annually attract thousands of visitors but serve to regulate the flow of the rivers passing thru them so that the supply of water for power and irrigation is more dependable. As we shall see later, this mountainous rampart is also very important in determining the climate of the valley. Finally, the Alps and Apennines are serious commercial barriers so that direct access to the countries beyond them is limited to passes.

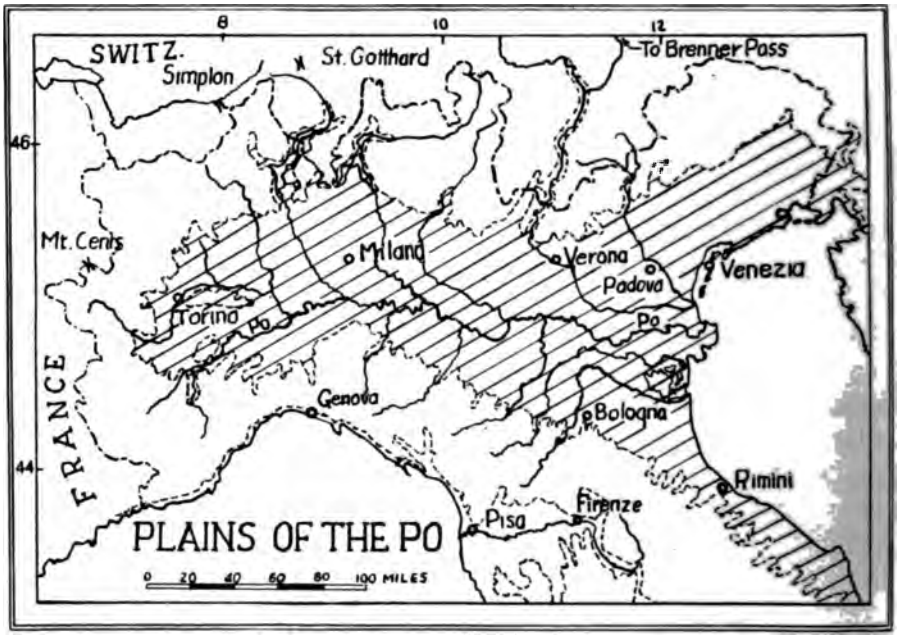

Fig. 1. Sketch map showing the relation of the Po and its cities to the mountain passes and the sea.

The drainage of the plain consists of the master stream, the Po, and its tributaries together with some smaller rivers in the east which reach the Adriatic independently. The river Po fed by the melting snows of the Pennine Alps in Piedmont crosses the entire plain from west to east. In its upper course it is swift and turbulent, but eastward the slope becomes less and less so that in the eastern third the stream winds sluggishly about thru marshes and fertile fields, finally emptying into the Adriatic thru a vast delta. Thruout this lower portion the channel, like that of the lower Mississippi, tends to silt up and only by the help of hundreds of miles of dykes is it restrained from flooding the countryside. The delta is still being rapidly extended, for as more sediment is brought down, the lagoons and marshes are filled and become dry land while new lagoons are formed farther out in the Adriatic. About 175 acres are added in this way each year altho as shown in Fig. 3, their cultivation at first is a problem. Thus, while the western or upper part of the valley is marked by irrigation works and water power

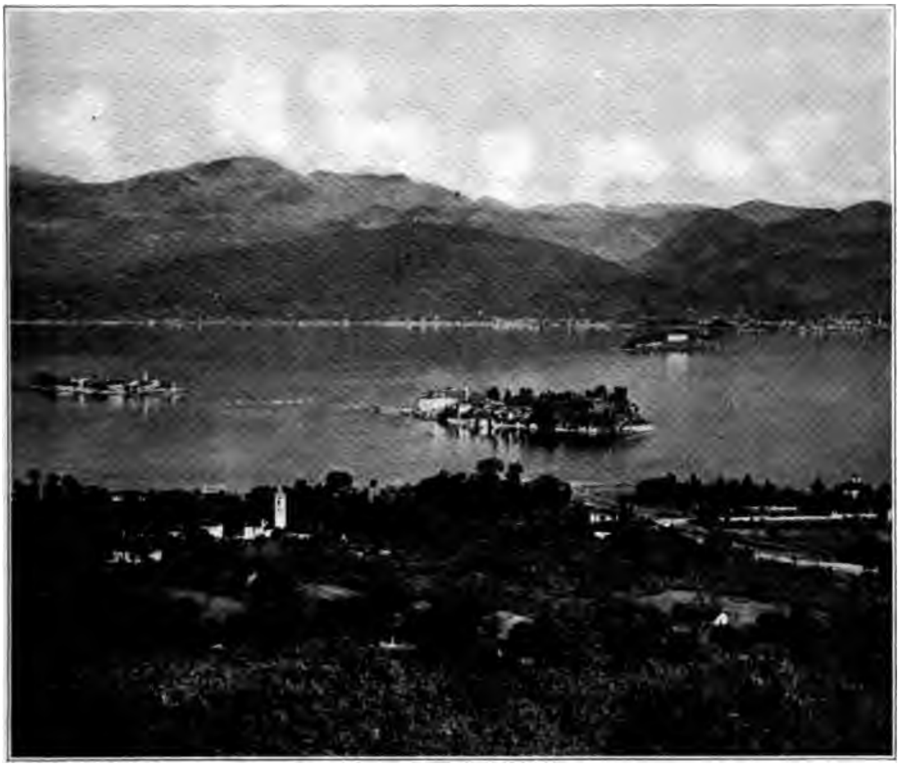

FIG. 2. Lake Maggiore, one of the most attractive of the Italian Lakes. Courtesy, Italian Tourist Bureau.

plants, the major problem in the lower or eastern portion is one of dyking and drainage. Difficult as it is both for navigation and for bridging, the stream and its marshy banks are of doubtful economic value. In most great valleys the main stream and its banks are the foci of various activities and serve as a unifying influence. Not so the Po. Its banks do not serve as sites for cities nor is its channel an important transportation route. On the contrary, the expense of keeping it in control and the constant danger of floods make it a real menace.

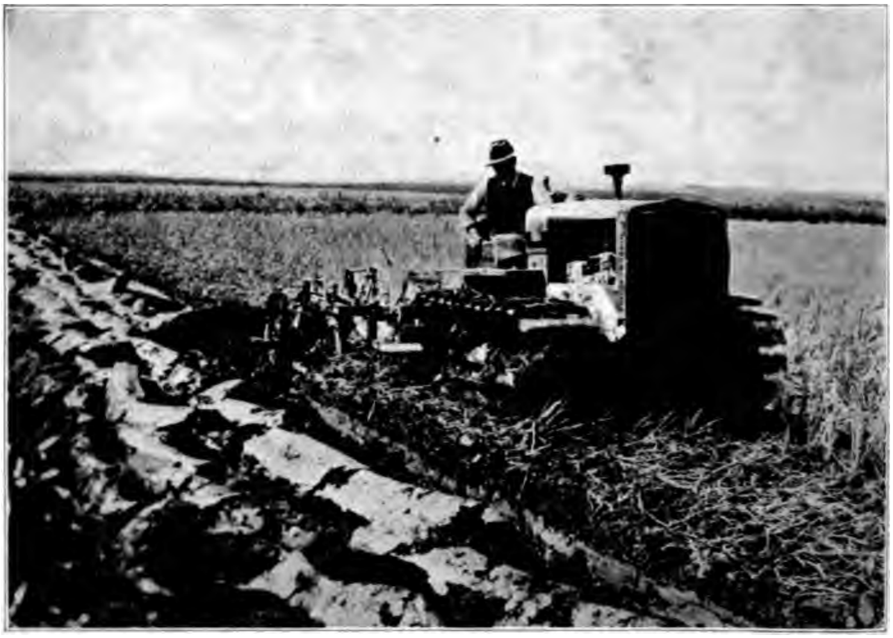

Fig. 3. Plowing a rice field in the Po delta. Here the ground is too soft and wet for animals and for most wheeled machines. However, modern caterpillar tractors are solving the problem. Note the flatness of the region. Courtesy, Caterpillar Tractor Co., Peoria, Illinois.

Climate

Scarcely second in importance to the levelness of its surface is the favorable climate. Encircled on three sides by mountains, this region is not Mediterranean. Rather does it have a modified continental type. Tho in the latitude of Minnesota or Maine, it is far from having their extremes. As compared with most of Italy, however, the winters are relatively cold, the summers hot, and there is no extended dry season. Milano winter temperatures are as cold as those of London 600 miles farther north and its summer is warmer than Naples over 300 miles farther south. Like much of the northwestern Europe, the winters are rainy with much fog. Snow not infrequently mantles the plain for a week at a time. The coastal section near Venezia (Venice) has a somewhat milder winter temperature. The maximum rainfall comes in the spring and autumn with frequent thunder showers during the summer. Thus, while southern Italy lies parched and baked thru a hot, rainless summer, the Po Basin remains fresh and green. The rainfall at Milano averages 39.8 inches, about the same as St. Louis. As a consequence, crop yields here are not only larger, but much more dependable. The summer rains, supplemented by irrigation, also show their influence in the greater importance of pasture and the dairy industry. In peninsular Italy, sheep and goats largely replace cattle and the olive tree must serve as the "dairy cow."

AN ENERGETIC PEOPLE

Owing partly to the invigorating climate, partly to the admixture of blood from the hardy, virile invaders who in the past repeatedly swept over these plains, the people are unusually able and energetic. Likewise, their location near the more progressive peoples of northwestern Europe has, thru frequent contact and the interchange of goods and ideas, served to stimulate the inhabitants. Their living standards are higher, their illiteracy less, and, in general, they are much more advanced, both economically and culturally, than are peoples of southern Italy.

CITIES

Hemmed in by mountain and sea the chief cities are naturally located where routes lead to the outside world. However, as has been said, the lower Po and the Adriatic coast are both swampy. Thus, passes thru the encircling mountains are the favored sites for cities. As a consequence, we have here the curious situation—that the chief city, Milano, is on neither the river nor the coast, but on the plain; and the chief port used, Genova, is not on the Adriatic at all!

Milano, the greatest industrial and commercial city of Italy, has a population of almost a million. It is located at the intersection of the old east-west route along the plain, with routes running north to Switzerland via St. Gotthard and Simplon. Their relative positions are shown in Fig. 1. Well supplied with hydroelectric power it has developed into a great textile and machinery center. It is the leading Italian cotton manufacturing city and rivals Lyon in silk-making.

Venezia, with some 200,000 people is often termed the Queen of the Adriatic. The city grew from the settlement of refugees who fled to the marshy islands and eventually built up a great commercial city-state. It occupies a unique site on a group of 120 islands in a lagoon behind the long sandy barrier—the lido, as shown in Fig. 4. A two-mile bridge joins it with the mainland. Its chief problem consists in maintaining a deep outlet to the sea, a struggle culminating in the recent construction of the main harbor on the mainland and the improvement of the port on the islands. The city's historic attractions bring some 600,000 tourists annually to see its art treasures and historic buildings. See Fig. 5. Formerly the chief gateway of the Po Basin, it gave way to its old rival, Genova. What the recent improvements will do remains to be seen. It has always served as the seaport for the Brenner Pass route via Verona.

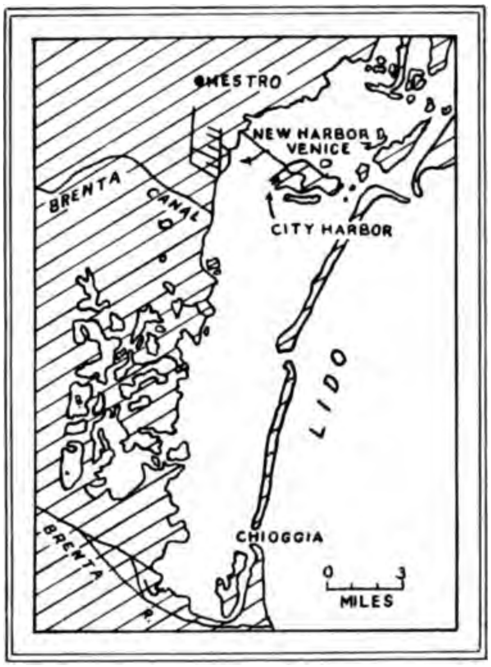

FIG. 4. Sketch map of Venezia. Note the new port being built on the mainland.

Turino, the only large city on the Po, commands the route to the Mt. Cenis tunnel and the Rhone Basin. Southward it is joined with Genova by the Bochitta Pass. Because of its automobile plants it has earned the title of "Detroit of Italy."

Genova (Genoa) has a much better harbor than Venezia and is the chief port for the Po Basin as well as for considerable Swiss trade.

Bologna lies where the Firenza-Venezia route crossing the Apennines via the principal pass, meets the plains route which runs along the base of the mountains.

FIG. 5. The famous Rialto, Venezia, is better known for its beautiful old palaces than for its commerce. Courtesy, Italian Tourist Bureau.

The homes of the farmers are as a rule not scattered thru the countryside. They live in rather compact villages of brick or stone, the houses being high and set close together with narrow and oftentimes crooked, winding streets. Occasionally, however, one comes upon a well-to-do farmer who lives upon his land. His large brick house, his barns and outbuildings are all enclosed by a high stone wall.

AGRICULTURE HIGHLY DEVELOPED

The basin of the Po has been often referred to as the "Garden Spot of Europe"—and rightly so. Favored by climate, soil, and topography, the dense population has, thru the centuries, drained and levelled, irrigated and terraced, fertilized and cultivated until the countryside resembles a vast checkerboard of luxuriant meadows and gardens. At least the small size of the holdings and their intensive cultivation make them seem more like gardens than farms. It is, in short, an agricultural region par excellence.

The garden-like aspect of the agriculture is further emphasized by the mixture of crops within the same field. A typical farm will have rows of mulberry trees perhaps 200 or 300 feet apart. See Fig. 6. Between these are cultivated cereals, such as wheat or corn, and finally, in the rows and about the trees are vines. Thus, the same land is used at the same time for growing grain, mulberry leaves, and grapes—an intensive use of the land possible only where labor is abundant and land is limited. In addition it is common practice to grow two or more successive crops on the same plot, the second one being planted immediately after the first is harvested. Thus, the annual yield per acre of any single item will naturally not be large, but all the produce together makes an enormous output. Fences are largely lacking but boundaries are marked by rows of trees, by hedges, or simply by stones set at the corners.

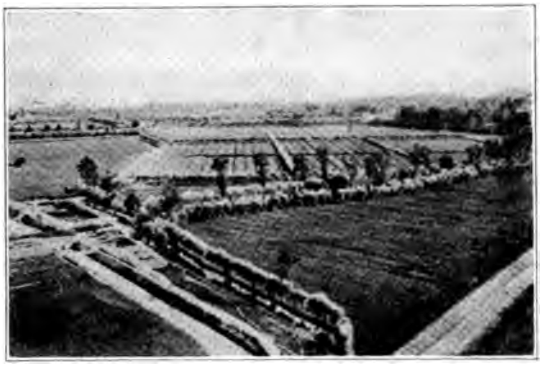

FIG. 6. Irrigation and intensive cultivation near Milan. Courtesy, U. S. Dept. of Com.

Irrigation. In spite of the better rainfall of the plains, it is here, and not in drought-ridden southern Italy, that the major part of the irrigated land is to be found. True, certain crops are produced without resort to artificial watering, but with the highly intensive methods used, irrigation plays an important part in insuring high yields. Like fertilizer on soils of moderate fertility, a controlled water supply can be an extremely effective aid in increasing the output. For example, as many as six or eight crops of alfalfa may be harvested in a single year. Of course, the ready availability of water from the melting snows of the Alps has been an important factor. Even many of the great meadows are watered. Some three-fourths of all of Italy's irrigated acreage is here and, as a whole, over one-half of the Po basin is artificially watered.

Crops and Animals. As with most of the Mediterranean region, wheat is the outstanding crop of the Po Basin. This section accounts for two-fifths of the Italian crop and its yields per acre are about double those of southern Italy. However, the Italians consume much grain both as bread and macaroni—more than one-half as much again per person as we do—and wheat has been their leading import. Domestic production has been increasing, however, due partly to the government's "battle of the grain" and in a good year it is thought the nation can be almost self-sufficing.

Thanks to the warm, wet summer, the Po Valley is Italy's "corn belt" and polenta or corn mush is an important item in the diet of the poor.

The Po Basin is Europe's chief rice area. In the irrigated lowlands about Milano and in the Po delta, rice of an excellent quality is produced. Local consumption is small, however, so that most of this foodstuff is exported—an unusual circumstance for Italy.

The vine is found widely grown here, as elsewhere in Italy, sometimes mixed with other cultivated crops, more often sharing with orchards the foot-hills about the plain. Trees 20, or even 30 feet, apart may be joined to each other by festoons of grape vines.

In addition to the major crops listed, there are a number of lesser importance, among them hemp, sugar beets, rye, and on the slopes, many chestnuts.

A climate well suited to the mulberry and a dense population furnishing abundant labor, supplies the basis for Italy's raw silk industry—practically all of which is concentrated in the Po Basin. Altho Italy ranks far below China or Japan in quantity, it excells in quality, and raw silk constitutes Italy's leading export item. The industry has outgrown the domestic supply or cocoons and many of the latter are imported from the Far East.

The importance of the plains in Italian agriculture is shown by the fact that in only two major crops is this region of less importance than the rest of the country. The olive and citrus fruits are of little importance here due to the winter cold. However, for the remaining items this section is dominant. Thus, with only one-fifth of the area, it accounts for 30-40 per cent of the wheat, 55 per cent of the corn, 99 per cent of the rice, 85 per cent of the sugar, 70 per cent of the hemp, and 90 per cent of the silk of all Italy.

The non-Mediterranean character of the Po Basin is again shown in its large number of cattle—especially dairy cattle. Pastured on the nearby lowlands of the Po as well as on the "water meadows" of the foothills encircling the valley, are many fine dairy cattle. However, stall feeding is quite general. As in the Alpine valleys of Switzerland, cheese making here has become an art and Parmesan and Gorgonzola cheese are known far and wide. Since olive oil is commonly used over most of Italy, the cheese is largely exported with a value, in some years, almost as great as that of citrus fruit. The production of foodstuffs is in general insufficient so that imports, e.g. wheat, meat, cotton, wool, and animal fats are necessary. Exports, on the other hand, are chiefly manufactures especially luxuries, e.g. raw silk and wine.

MANUFACTURING

Conditions Affecting Industry. In the physical setting for industrial development, nature has, in the Po basin, dealt kindly tho not lavishly. Compared with the rest of Italy, or with the Mediterranean region as a whole, it is highly favored, yet it cannot hope to rank with the countries or northwestern Europe with their generous endowment of fuel and raw materials.

Like the rest of Italy, this region is lacking in coal and iron—the sinews of modern industry. Yet here are to be found two important assets, (1) a large and never-failing supply of water power—the so-called "white coal" and (2) an abundance of cheap skilled labor. Added to these are the (1) dense agricultural population serving as an important market as well as a supplier of certain raw materials, (2) easy access to the sea, and (3) a very substantial government aid and encouragement. As a result there has grown up here a manufacturing region of considerable importance.

Manufacturing, a Recent Development. Modern industry is a comparatively recent growth here. In Medieval times both northern and central Italy were the workshop of Europe. With the industrial revolution based upon the factory and power-driven machinery, large scale manufacturing shifted to northwestern Europe. Not until it was found that waterpower could be transformed into electric energy and that electricity could be carried long distances, did the Po basin come into its own.

To further stimulate industrial growth there arose after the World War the pressing problem of employment. Italy with limited resources had been increasing its population at a rapid rate. Emigration served to care for the surplus until recently when restrictions in many countries checked this movement. Thus, industry has been looked to to absorb the population increase and every effort made to extend this market for labor.

The Alps are the great power house for Italy and their location makes the Po basin at their foot the main industrial section of the Kingdom. Towering high above the fertile plains, these ranges intercept the moisture-bearing winds. The slopes are rain drenched, their upper portions snow-capped or glacier covered, and the rivers descending steeply offer many power sites. At their base is a dense population offering ample labor for industry. This almost ideal setting has led to a vigorous program of industrial development. Italy leads all countries in the proportion of its waterpower actually exploited—about two-thirds—and it is the ranking European country in total hydroelectric power produced. At present it has water power plants with a capacity of about 5.8 million h.p. of which 2.8 million h.p. are located in the northern plains. This latter would be equivalent to about 14,000,000 tons of coal—about the same as the annual output of the Indiana coal fields. Coal imports of Italy in 1934 were almost 12,000,000 tons; petroleum, 20,000 tons.

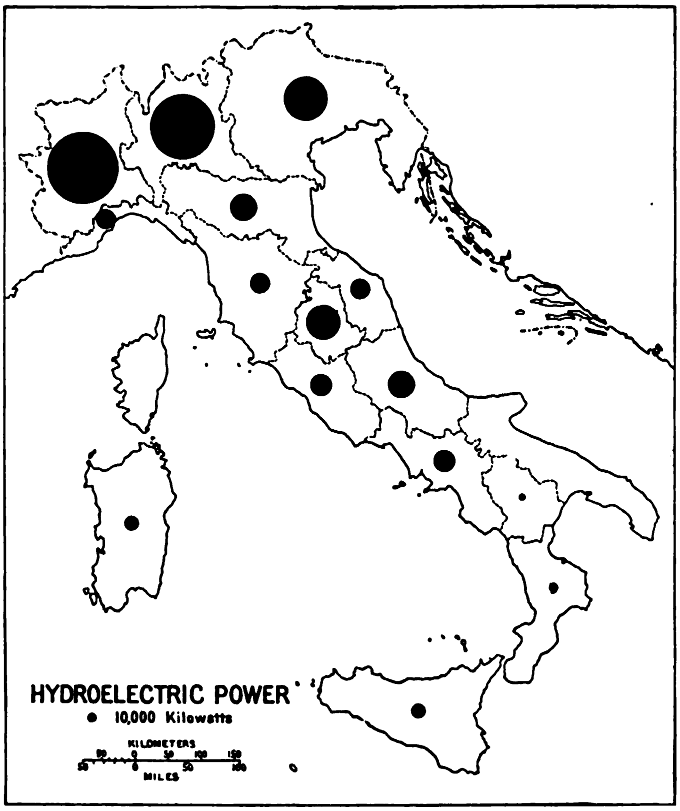

FIG. 7. About three-fourths of the developed hydroelectric power of Italy is in the Po Basin.

Character of Manufactures. Naturally, the kind of manufacturing is shaped in part by the conditions described. Other types developed it possess general validity, but it must be valid for the situation in which it is used, and for the purpose to which it is put. A test may have been constructed on the basis of all the generally recognized objectives of a given subject matter field. Now suppose that test is administered to a group whose objectives were much more limited than those covered by the test. Obviously it lacks complete validity for that group. A foreign language test heavily loaded with grammar questions lacks validity for a group concerned with developing a reading knowledge of the language with a minimum of attention to grammatical construction. Again, a general survey test may not be valid for diagnosing individual difficulties in a limited phase of the subject. A general survey test in arithmetic for example may not reveal specific difficulties in the solution of problems involving the division of integers or of decimals.

It is often assumed that a test to be valid and reliable must necessarily be of the short answer type and wholly objective. On the contrary, it is possible to have valid and reliable tests of the essay or problem type *providing* the responses are scored objectively—a procedure which is perfectly possible and which should be followed by anyone who scores examination papers. The difficulty with the problem or essay type is the limited sample which is all too frequently included thus reducing its reliability. But it is entirely possible to overcome this difficulty.

With this general consideration of the type of test under consideration we may now turn to the practical uses to which such a test may be put in a school.

STANDARDIZED TESTS MAY BE USED FOR SURVEY AND APPRAISAL

A superintendent wishes to know how closely his school approximates the norms of a nationally used test. He administers to his school system a valid and reliable instrument whose norms are known. He may then compare his norms with those of the test on several bases—his school system as a whole, the various administrative units within the system, grades, chronological age groups, mental age groups, and any others that he may desire. He may discover that his system as a whole compares very favorably with the national norms. But he may find one building differing widely from another. A further examination may reveal mental age differences which account for this variation—that when mental age norms are compared the showing is quite different. It is possible to have grade for grade in the same city a mean difference of an entire year in mental age between the pupils in one building and those in another.

By a careful analysis of his scores the school administrator can secure a wealth of facts on which to base administrative and supervisory procedures.

USE OF STANDARDIZED TESTS IN DIAGNOSIS

Diagnosis may be of the entire school system, or a building, or a group within a building, or an individual pupil. A school system may rank consistently below the tests norms in one subject. An examination may reveal the fact that the objectives of the school system differ widely from those on which the tests are based. A large city rated consistently lower than the published norms on the physiology and hygiene section of the Stanford Advanced Examination. A careful diagnosis revealed differences in objectives and in emphasis. Having made that discovery the superintendent could change his objectives to conform with those on which the test was based, or he could continue to emphasize his own objective and search for a valid appraisal instrument in that field.

An entire room or building may compare unfavorably with the norms while other units of the system show no such variation. A study of this situation may show that certain remedial measures are desirable.

But probably the most effective type of diagnosis is that which concerns the individual pupil. Any test administered to a group will reveal a great variety of individual difficulties. No two pupils will show exactly the same combination of troubles. And it is rare to find any specific trouble that characterizes more than fifty per cent of the pupils in a class. The preparation of a two-way chart will reveal to the teacher each individual's difficulties and for each specific point the individuals having trouble with it. Such diagnosis has probably been applied more widely in the field of reading than elsewhere, with the result that thousands of children are now becoming effective readers who, a few years ago, would have remained poor readers. Comparable work remains to be done in many other fields in some of which hardly a beginning has been made.

In diagnosis, the general achievement type of test is usually not detailed enough to reveal the specific points that need to be discovered in order to formulate a remedial program. But the weak pupils will be revealed by the more general type of test and then follow-up testing can be done with an instrument which is more diagnostic in character.

USE OF STANDARD TESTS IN THE CLASSIFICATION OF PUPILS

If the test has age and grade norms it is apparent that when such a test has been administered to a pupil, his score on each component part of the test and on the test as a whole will be revealed. Suppose a new entry is received from some obscure school. The principal is at a loss to classify him. On the basis of test results he can be given a classification which need be changed only if he performs much differently from the results revealed by his test.

Or a teacher may suggest that a pupil be advanced more rapidly than the other members of the group. The results of a carefully standardized battery of tests will reveal how far in advance of his present classification that pupil is actually achieving.

Or again a teacher may suggest that certain pupils be retained in the same grade for another term. Their test results will reveal very promptly whether their achievement is such that they cannot hope to achieve up to the standard of the next grade should they be promoted.

USE OF STANDARD TESTS IN THE MOTIVATION OF THE WORK OF THE SCHOOL

A school below the published standards may strive to equal or excel them within a given period. Or individuals may strive to improve their own scores by working against their own records rather than competing with their neighbors. Room charts and individual charts may be prepared with interest at times reaching white heat.

USE IN THE AREA OF EXPERIMENTAL EDUCATION

A new method of teaching a subject is suggested. The school system wishes to try it. Equivalent groups are set up on the basis of standardized test results, possibly in combination with other factors. To one group the experimental method is applied; to the other the prevailing method. Comparisons are made of results secured from a second application of an equivalent form of the same test, and the new method appraised on the basis of results thus secured.

The uses here so briefly suggested argue for the preparation in each and every field of activity of carefully constructed tests of the achievement and of the diagnostic type which can be standardized. Such instruments and procedures in the hands of teachers and supervisors carefully trained to use them should result in a better type of learning than is now all too frequently the case.

THE USE OF TESTS IN HIGHER EDUCATION

Up to this point we have discussed tests from the point of view of that group interested in improving the learning of children of elementary and secondary school age. But the application of standard tests and of modern testing technics may be of interest to college and university instructors. There is without doubt room for much improvement in the preparation and standardization of tests on the higher education level. The magnificent work done at the State University of Iowa and at the University of Chicago in recent years indicates in a general way what may be accomplished. Carefully standardized tests can be used on the higher education level for survey and appraisal, for individual student diagnosis, and for classification and sectioning. In short, many of the uses suggested for the elementary and secondary school level are valid for the higher education level as well. Now for achievement testing in the courses offered may it be in order to suggest that we need first of all to define our objectives and outcomes for each unit of the work with meticulous care. These should be so clearly stated that not only do we as instructors understand them but our students comprehend them as well. The latter should know precisely what knowledges and skills and habits should eventuate as a result of pursuing a given unit of work.

Following that we should formulate valid and reliable tests covering each unit. Equivalent forms of these should be prepared so that the questions are being changed constantly. We should then determine some point on the scale represented by that test which is the minimum passing point. Every student attaining or surpassing that point should receive credit, and every student falling below should fail to receive credit. We might then have an entire class whose every member would receive credit for the course. By this sort of procedure both students and instructors could shake off that fatalism that characterizes some institutions that no matter what quality of work is done a certain percentage must fail. Further, it would be entirely possible for a student to pass the examination early, secure his credit, and go on to another course rather than mark time as some now do while the other members of the class plod along. This would also change that rather paradoxical situation, in some institutions, where in spite of more and more rigid entrance requirements, and a more and more carefully selected student body, the same percentage continues to fail.

I believe that the standardized test has a very large function to perform in education. We have mastered quite thoroly the technic of constructing these instruments. It is now necessary that we learn to use them intelligently to assist us in the processes of education.

THE POSITION OF GEOGRAPHY IN THE HIGH SCHOOLS OF THE NETHERLANDS

H. Eggink[1]
Municipal Lyceum for Girls, Amsterdam, Netherlands

There is conflict in the educational world, even in peaceful Holland, which, altho it was not drawn into the World War, has nevertheless been affected by many of its consequences. As are the educators in other European countries, we, too, are asking ourselves whether our educational system is on the right track; whether we are not clinging too much to tradition, thus losing sight of a reality the demands of which are now so markedly different from what they were in the immediate past. We too, are beginning to doubt whether the claims to educational superiority of such subjects as classics and mathematics, which are still so firmly enthroned in many of our schools can be substantiated.

Geography, Old and New

It must be conceded that both classics and mathematics did much for the development of the young student; they taught him to think logically—or, at least, in the hands of good teachers they could do so. For a long time geography, among other subjects, was not able to achieve this, as it consisted only too often of nothing but the memorizing of names and disconnected facts. But modern geography has long outgrown this stage, and something better has taken the place of the acquisition of mere factual knowledge.

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[1] Translation and adaptation by W. Van Royen, University of Nebraska.

One needs only to study the current textbooks to discover that, if well taught, geography can hold its own among its sister sciences in the high school curriculum.

Furthermore, the practical value of geography appeals to modern educators. It is hardly possible to read intelligently a newspaper or a serious periodical, and it is exceedingly difficult to appreciate many of our present problems without a good geographic background. And in our modern world, where people travel with increasing frequency, how much more enjoyable and fruitful do these travels become when one has learned to read a good topographic map, and to observe and analyze the physiographic and social geographic phenomena! More and more geography is recognized as one of the most valuable subjects in the high school curriculum.

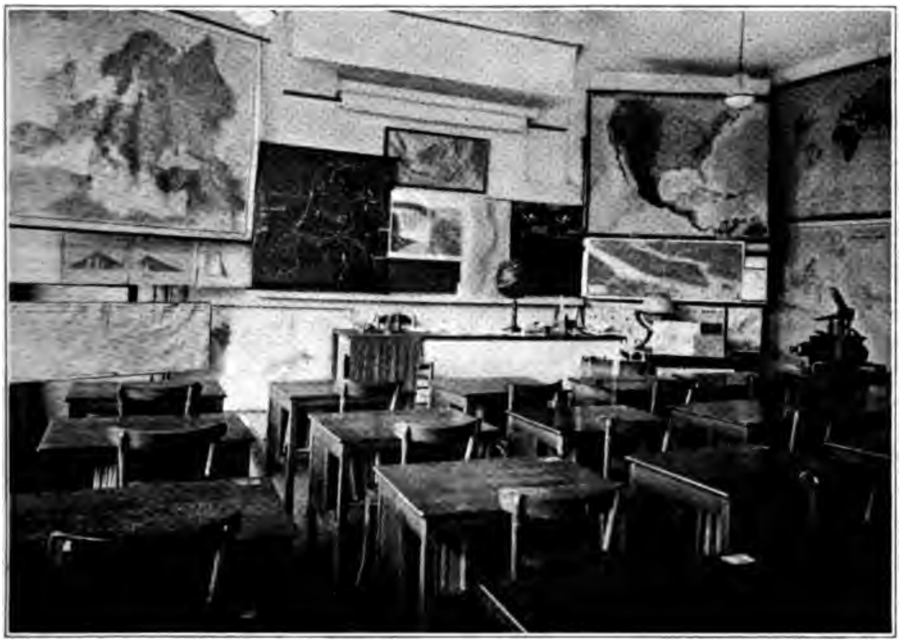
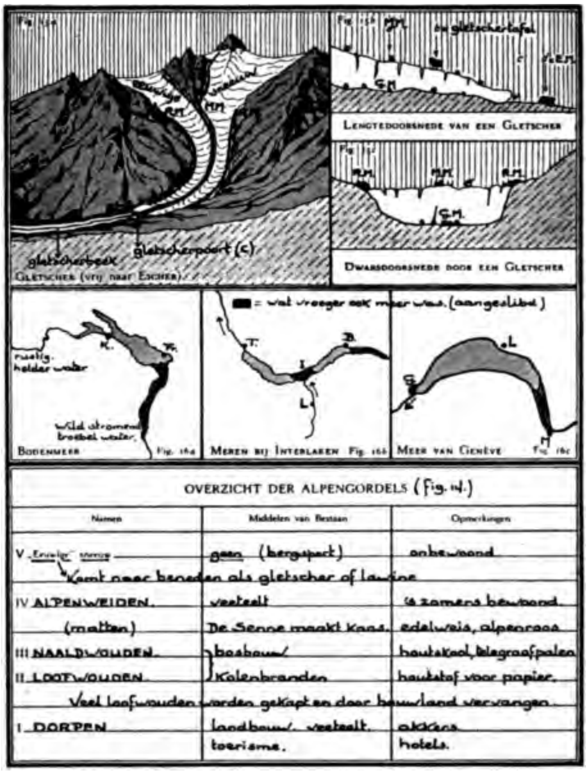


FIG. 1. Interior of the geography room of the Lyceum for Girls at Amsterdam, Netherlands.

In the Netherlands geographers, in increasing numbers, enter positions and professions where they naturally belong. While formerly practically all who finished their geographic studies at a university went into teaching, at present we find our colleagues with the topographic survey, with the colonial labor inspection, in the it is often necessary to teach two subjects. In the larger schools the geographer usually teaches only his own subject. About ten per cent of the geography teachers in the high schools of the Netherlands are women.

MATERIAL EQUIPMENT

The Dutch high school buildings, at least judging by photographs of American schools, are not as large and imposing as those in the United States. Practically every high school, however, has its own geography room, with sufficient space for the storage of equipment. Fig. 1 is a photograph of the geography room of the lyceum mentioned above. There are from 24 to 30 pupils in each class.[4] The students sit at individual desks. Each desk contains an atlas, albums of geographic illustrations, textbooks, and supplementary reading material. On the walls generally hang different kinds of world maps, physical, climatic, political, ethnographic, etc. There is also a map (or maps) of the surrounding region, since we try as much as possible to find material for comparative purposes. In addition to these we have other maps, a library for student use, reference works, such as statistical publications, railroad


gletscherbeek
gletscherpoort (c)
Gletscher (vrij naar Escher)
M.M.
G.M.
R.M.
gletschertafel
Lengtedoorsnede van een Gletscher
Dwarsdoorsnede door een Gletscher
= wat vroeger ook meer was. (aangeslibd)
rustig. helder water
wild stromend troebel water.
K.
T.
I.
L.
G.
Bodenmeer
Meren bij Interlaken
Meer van Genève

OVERZICHT DER ALPENGORDELS (Fig. 14.)

Namen	Middelen van Bestaan	Opmerkingen
V "Eeuwige" sneeuw	geen (bergsport)	onbewoond
Komt naar beneden als gletscher of lawine		
IV ALPENWEIDEN.	veeteelt	's zomers bewoond.
(matten)	De Senne maakt Kaas.	edelweis, alpenroos
III NAALDWOUDEN.	bosbouw/	houtskool, telegraafpalen
II LOOFWOUDEN.	Kolenbranden	houtstof voor papier.
Veel loofwouden worden gekapt en door bouwland vervangen.		
I DORPEN	landbouw/ veeteelt.	akkers.
	toerisme.	hotels.

FIG. 2. A page out of a Dutch workbook. This page relates to the geography of Switzerland. Coloring and lettering is done by the students according to data contained in the textbook and discussion by the instructor. At the bottom is shown the altitude belts in the Alps, the names of the belts, the human activities and remarks.

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[4] These figures represent the number of students in each year. V. R.

ιirway guides, dictionaries, an encyclopedia, etc. We also use a rn or balopticon for which several American geographic maga- often furnish excellent illustrative material. In an annex there portunity for the modeling of land forms in clay or plasticine.

TEACHING OF GEOGRAPHY

t is difficult to state how the subject matter is taught. Naturally y teacher does this in a different manner. Each one tries to lop the methods which best suit him as an individual, and which best adapted to students. There- it is probably ap- riate to refer to own methods.

'irst of all, the ents must learn to learn. During periods we teach ι how to study textbook. They have to learn to discriminate een the impor- geographic facts the details. For purpose we have rkbook[5] which is what different ι the American s we know, as for mple Ridgley's. It be used with any ιe principal exist- extbooks, since in of these the main ts are, of course, approximately the same. By answering the tions in the workbook the students are forced to search for the important items; they learn to organize the subject matter, to things down schematically and to think about the "why" of gs. Fig. 2 gives an example of a page in the workbook, relating

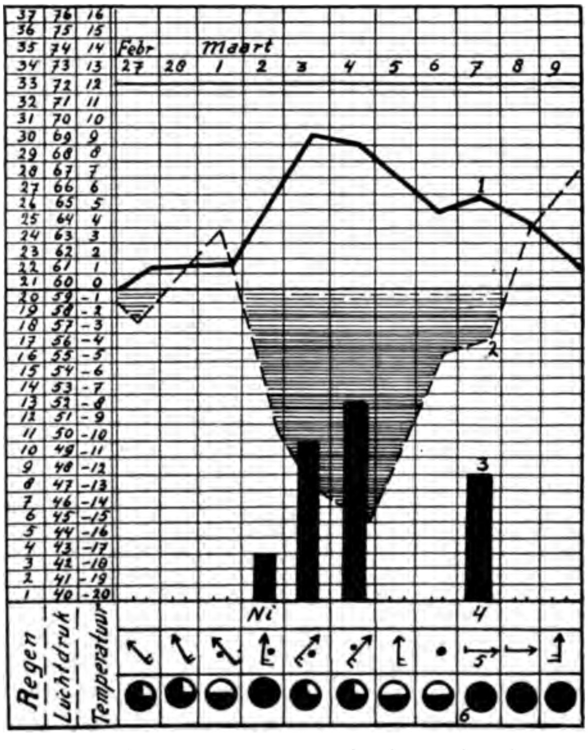

FIG. 3. A weathergraf as used for day to day observations by the students: 1. temperature; 2. pressure; 3. precipitation; 4. types of clouds; 5. wind direction and velocity; 6. cloudiness.

Cohen en Eggink, Werkschrift voor Europa. 4th Edition. J. B. Wolters, Groningen.

to Switzerland, which will be clear to any geography instructor.

A second and important point is that as much as possible we stimulate purposeful activity on the part of the students. Young students like to do things and modern psychology has taught us that in this way the subject matter is better digested. Therefore, our students do much drawing, coloring, modeling, etc. Fig. 3 represents a weathergraf which is kept up to date by one of the classes. By use of such devices we stimulate the interest in weather phenomena. By means of assignments certain aspects of geography are studied in the different museums of the city. Thus the instructor does not do all the talking; the students take an active part in the presentation of material and in discussions.

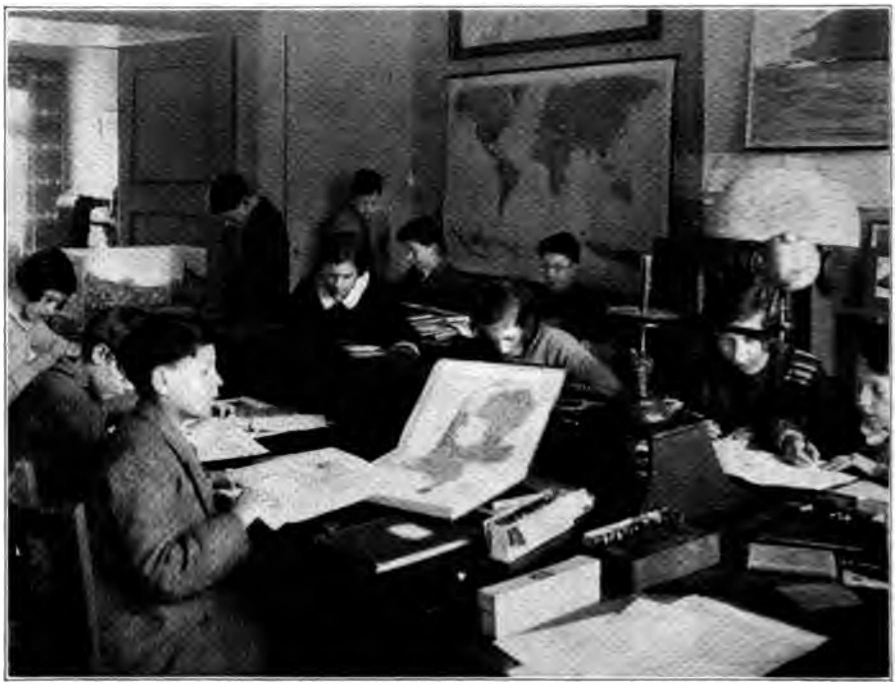

FIG. 4. Individual work of the geography class at the Montessori Lyceum, Amsterdam, Netherlands.

FIELD TRIPS

We regularly make geographic excursions with our students. Several years ago I reported in this publication[6] on a trip with forty students of one of the high schools in the Dutch East Indies to the crater of an active volcano on Java. From our school in Amsterdam we have visited Paris, London, the Eifel mountains in Germany, the Grindelwald region of Switzerland, and Flanders. This year, 1936, we made a bicycle trip thru the island of Wight. What a pleasure to be able to tell the students about glaciers and moraines from the Scheidegg in Switzerland! The value of these trips depends primarily upon a good preparation by the students and afterwards the writing of a comprehensive report. It is unnecessary to state that our own country is not forgotten. There are already some lycea which have their own houses in a pretty spot in an interesting part of the Netherlands. With an entire class one goes there to spend some time in studying the geography of the surrounding area.

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[6] H. Eggink, A letter from the Far East, JOURNAL OF GEOGRAPHY, Vol. 22, Sept. 1923, pp. 217-223.

CONCLUSION

The position of geography in the high schools of the Netherlands is not unsatisfactory, altho an increase in the number of hours devoted to geography in the higher classes is desirable. Fortunately geography is becoming more appreciated as a highly valuable subject in the high school curriculum. This greater appreciation of the educational value of geography is a result of various circumstances, internal as well as external. An important factor is that at present most of the instructors of geography in the high schools have received their training in subject matter at the universities. The results of a better preparation are reflected in a greater efficiency of teaching in the high schools and in the increased prestige of a subject which must be considered as invaluable for the training of intelligent citizens.

SOME EFFECTS OF WEATHER ON THE URBAN DWELLER

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Popular, uninformed opinion in most large cities today supposes that man, other than the farmer, has been largely freed from significant climatic influences. The average urban dweller no longer exhibits that anxious concern about what tomorrow's weather will bring that characterized his forefathers. It is true, no doubt, that he may lament a rain that spoils a Sunday game of golf, or is discomforted in his attempts to sleep during an excessively hot and humid period, but that the weather can and does vitally affect the pocketbook and the life of himself and his fellowmen is a thought that seldom if ever enters his consciousness.

Many recognize the fact that man in earlier times was highly dependent upon the whims of climate, but they feel that today, in our cities, we have to a large extent obliterated disastrous and even many discomforting climatic effects. The marvels of engineering and science have freed us, they believe. They point with pride to our highly heated homes where the dangers from cold are offset, to the steel backbones of our larger buildings that can withstand tremendous wind-pressures, to refrigeration that aids our purses by saving our food, to the beginnings of air-conditioning that promise to free us from the heat of summer, to steel bridges that can withstand floods, to hugh river dams that maintain water traffic during low-water and help prevent floods during high-water. All these and many others, they claim, make the health and finances of the city dweller largely independent of that most fickle element in nature, the weather.

The above factual claims cannot be denied, but the inference drawn therefrom that we have essentially freed ourselves from adverse climatic effects can easily be proven false. Climate is not yet a wholly antiquated factor in the life of the average American urban dweller and many of its effects cannot be lightly passed by.

A practical means of demonstrating the potency of climate to the city dweller, even in this "advanced" age, has been chosen. News items, taken from the Cincinnati daily papers and relevant to climatic influences, were collected. The effects of climate on Cincinnatians themselves, on their business, on their trade, and in other fields are all represented. Undoubtedly, innumerable effects remain unreported. Nevertheless, as samples of what climate can still do to the city man, the following lists are probably representative.

THE FRIGID WINTER

During the latter part of January, 1936, Cincinnatians experienced approximately the coldest weather in the history of the city. Sub-zero thermometer readings became common for a period of several days. Temperatures as low as –16.5°F. were officially recorded. The frigid wave made itself felt in numerous ways. The following economic effects were reported in the daily Cincinnati papers for the period from January 20 to 29, inclusive:

1. Crews of the Emergency Road Service Department of the Cincinnati Automobile Club received over 100 calls from members alone in a three-hour period (Jan. 22). The large number of calls received by garages from non-members can be surmised.
2. Transportation facilities of all types were severely hampered. Trains were late, planes grounded, while autoists were warned of the dangers in travelling. (Jan. 22)
3. In an attempt to thaw out water-pipes, a parish-house in one of the suburbs of the city was badly damaged by fire. (Jan. 23) Other fires of similar origin but of less importance were given less publicity.
4. Drastic effects on humans themselves were due to the cold wave. Two men were reported frozen to death, while a dozen more were in hospitals suffering from frostbite. (Jan. 23)
5. Almost $25,000 damage was caused in the basin of the city, because water froze as soon as it left firemens' hose lines. (Jan. 23)
6. The frozen streets caused numerous persons to be injured in falls and by skidding automobiles.
7. Cincinnati coal companies experienced a boom in business and were kept busy filling orders to replenish the dwindling family bins. (Jan. 23)
8. Suburban car service was disorganized as taut trolley wires snapped. Taxicab companies reported they were hours behind answering calls. (Jan. 23)
9. Hotels noted increasing business as many travelers decided to remain in the city for the duration of the cold spell. (Jan. 23)
10. The cold was costly to the city. Expenditures for cinders, salt, and sand to spread upon the streets mounted. Removal of the snow was also costly, $2,000 being paid out in one night. (Jan. 23)

11. Traffic signals were kept burning all night to prevent their freezing. (Jan. 24) Seventeen had frozen because they were turned off the previous night.

12. The cold caused a high tension wire to snap near Loveland, Ohio (near Cincinnati) and 2000 persons were without lights and telephone for five hours. (Jan. 24)

13. Navigation in the Ohio River was difficult. In the Cincinnati district the river was three-fourths full of floating ice. (Jan. 25)

14. A record number of fire alarms for January in Cincinnati (300) was reported by officials. They were hoping that moderating weather would cause a let-up in the number of alarms. (Jan. 27)

15. A train wreck occurred near Cincinnati, caused by slippery rails due to ice and snow. The engineer claimed that slippery rails made it impossible for him to stop in time to avoid the crash. (Jan. 28)

16. The manager of the gas department of the Union Gas and Electric Company disclosed the fact that more than twice the normal amount of gas was metered out because of the cold. (Jan. 29)

17. A total of 1,700 water meters froze during January, officials reported. This was greater than the average number that had previously occurred during the whole year. (Jan. 29)

SPRING FLOODS

Every spring high-water is experienced along the Ohio River and its tributaries. Flood stage may be reached several times during March and April, with intervening periods of lower water.

During the spring of 1936, Cincinnati felt the highly moderated effects of the flood waters that had done so much damage along the headwaters of the Ohio. The city was fully prepared for the high-water and every possible precaution had been taken to minimize the damage. Even the precautions were costly, however, while some damage was still unavoidable. The following news items were reported in the daily Cincinnati papers during March and April of 1936:

1. Seventeen barges and a pumpboat broke loose from their moorings due to the rising waters of the Ohio. Four of the barges were sunk. The total loss was not estimated, but one of the barges was valued at $18,000, including the load of coal. (Mar. 2)

2. As the waters of the Ohio rose higher, many of the business firms in the bottoms district close to the river began moving stock from their basements. One company alone had a large crew of men

at work moving some 120,000 pounds of groceries. (Mar. 18)

3. A Cincinnati owned gravel-digger and washer sank in the Ohio River during a severe wind and rainstorm. Rising waters carried away the superstructure. (Mar. 18)

4. During the crest of one of the floods the dike surrounding the municipal airport developed a break. Planes were moved to higher ground, and a force of men were needed to repair the opening. (Mar. 27)

5. During and immediately following the flood, coal and food were distributed to the 5,500 persons who were on flood-relief rolls. (Mar. 30)

6. A $30,000 derrick that was torn loose from its moorings by high water on the Little Miami River struck a railway bridge and sank. The bridge was slightly damaged. (April)

THE SUMMER HEAT AND DROUGHT

The nationwide drought and heat-wave that was experienced thruout much of the United States during the summer of 1936 was not solely felt, in an economic sense, by the farmer. The urban dweller also received his share of evil effects, altho in some cases the extreme heat resulted in profit and not in loss to individuals.

The following news items were published in the Cincinnati daily papers during July, 1936:

1. A large ice-manufacturing plant in the city found a greatly expanded market for its product as the result of the heat. Not only did local demand increase sharply, but carloads of ice were shipped daily to many adjacent Indiana and Kentucky towns where ice-plant facilities were overtaxed. For a while, two carloads a day were shipped as far south as Louisville, Ky. (July 14)

2. Bathing and swimming-pools reported increased attendance during the extremely hot spell. (July)

3. A record for water consumption in Cincinnati was established on July 15, when 101,450,000 gallons of water were used thruout the city.

4. There was a shortage of electric fans thruout Cincinnati, almost all dealers had exhausted their supplies by July 15.

5. Because of the tremendous demand for lemons for cold drinks during the hot spell, lemon prices more than doubled within eight days. (July 15)

6. The diet of the average Cincinnatian was radically changed during the extreme heat of mid-July. Cold plate lunches, iced drinks,

and salads were reported to be the favorites by managers of the larger restaurants. (July 15)

7. Several firms suspended operations until the close of the heat wave. One firm, a manufacturer of paper products, reported that fourteen heat prostrations in their plant caused them to make the decision. (July 15)

8. Hospitals reported numerous cases of illness and death due to the heat. (July)

9. The rise in the retail price of milk produced by the drought cost Cincinnatians over $1,000 a day it was estimated. There was a drop of 20,000 pounds in the milk receipts of the city a day. (July 16)

10. Drought cut the city revenues $250 to $300 a week as fewer farmers marketed produce. The city taxes the use of the marketplace.

CONCLUSION

Cincinnati is typical of large American cities as regards the application of engineering and technical skill to the moderation of adverse climatic influences on its citizens.

Cincinnati is relatively free from most of those climatic elements that take a large toll of life and property. Strong winds are broken up by the hilly terrain, tornadoes are conspicuous for their absence, and of course the latitude and inland location preclude damage by hurricanes. The location, however, is far enough southward to escape the extreme cold of higher latitudes. Also, most of the city lies above the highest flood-waters of the Ohio.

Despite the above advantages, Cincinnati, like other urban centers, still suffers considerable inconvenience and loss because of the climate. Even the above brief survey of news items is sufficient to show the many and diverse ways in which the city dweller is physically and economically influenced by the climatic factor.

TEL AVIV: THE NEW CITY OF PALESTINE

E. RAY CASTO
Emory and Henry College

Tel Aviv is the youngest city in Palestine. It was born yesterday (1909), is now with 110,000 inhabitants in full tide of growth,* and is destined to grow still more. All other cities of Palestine have had a long history. They are old and as archaeologists dig, turning back the strata, cities upon cities are brought to view. In general they are cities of vanished greatness. The potsherds unearthed by the archaeologists indicate better days. Tel Aviv is the only city of the Holy Land which lacks visible or invisible ruins. It has no past.

Three decades ago the site of Tel Aviv was a waste of sand dunes. Today it is the most modern city in the Near East, the metropolis of Palestine, and is the only all-Jewish city in the world since the destruction of the Temple.

ORIGIN

In 1909 a group of the Jewish inhabitants of Jaffa founded upon the sand dunes north of this old city a garden suburb and called it Tel Aviv. Jaffa, the successor of the Joppa of Bible times, is mostly an Arab city. Jaffa had about 5,000 Jews in 1909. Rents in Jaffa were high, there was a lack of cleanliness, there was a dearth of opportunity for cultural development, all of which led the merchants, teachers, and officials in the neighboring Zionist settlements to found a town of their own. Arab riots were frequent. An important, if not the chief reason for the founding of Tel Aviv, was the necessity for the development of an all-Jewish center in order to safeguard an independent Jewish life. Thus the founding of Tel Aviv was essential to the emancipation of the Jews, and the city, in large part, owes its founding and its remark-

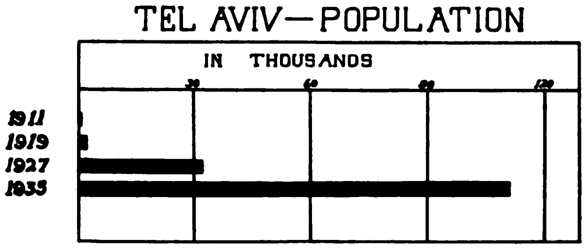

FIG. 1. The population of the city of Tel Aviv has grown with great rapidity.

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* Population in 1931 was 46,000 and in 1935 had increased to 110,000.

able growth to religious factors. In this it is not unlike the old cities of Palestine for nearly, if not quite, all of them had their origin as places of worship or as places of refuge. Joppa and Caesarea may be termed exceptions since they served for receiving and distributing sea-borne goods but their history is replete with the development of Judaism and of Christianity.

Municipal Building

This twin-city of Jaffa has been the pioneer in city planning in Palestine. A committee elected by all property owners and tenants administered local government from the establishment of the town until May 1921. Under the Turks public security was practically non-existent for the Turkish Government rendered little aid in the policing of the new town.

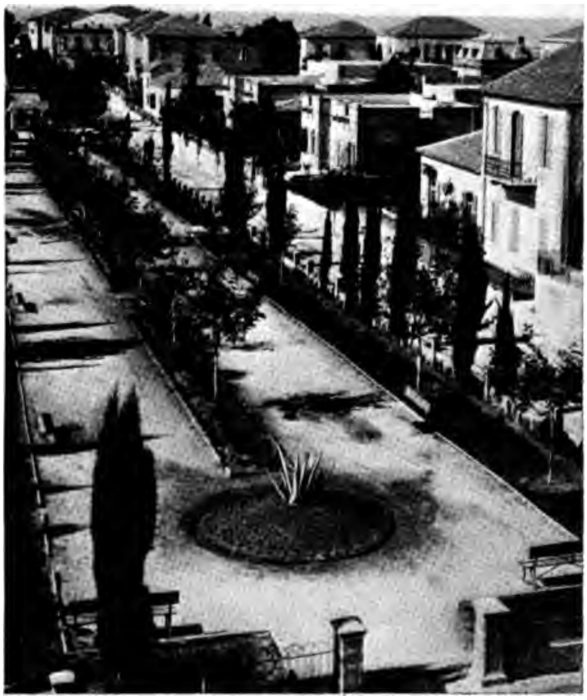

Fig. 2. A general view of the city of Tel Aviv.

In June 1921, the Palestine Government gave Tel Aviv legal powers to administer its own government. The city levies its own taxes, negotiates loans, and maintains its own police force. The granting of autonomous government was followed by a rapid growth due, in part, to the amalgamation of neighboring settlements. Municipal law has made the city one of the most modern in outer appearance in the world. The law of the city limits the dimensions of a house to a size covering not more than one-third of the area of the lot upon which it stands.

AN AGRICULTURAL CENTER

Tel Aviv is more than a cultural and a health center for the Jews of Palestine. It is an agricultural center for it has a large agricultural hinterland. Around it lies the rich coastal plain with its productive world-famed groves of orange, lemon, and grapefruit. The farmers have an increasing production of vegetables, dairy-products, and poultry-products.

AN INDUSTRIAL CENTER

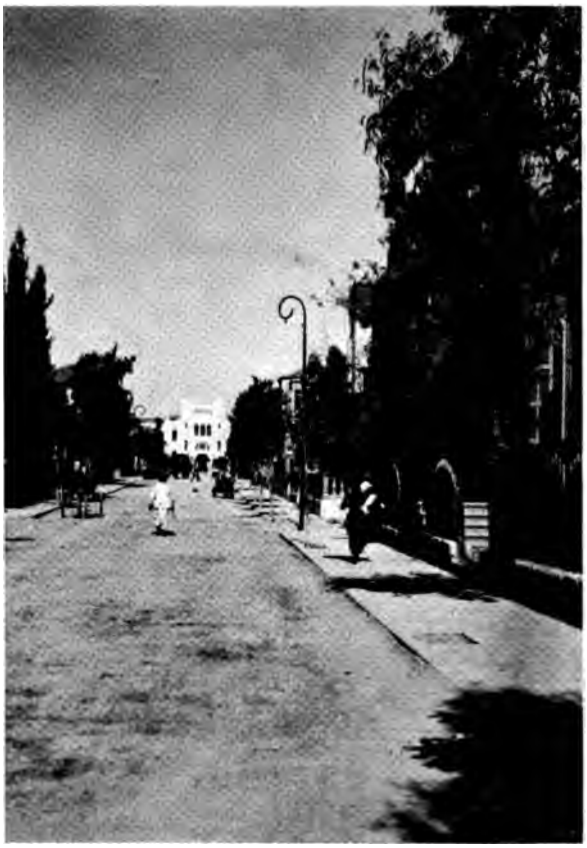

FIG. 3. Herzel Avenue, an up-to-date street in a modern city in an old land.

The amazing city of Tel Aviv has had a remarkable development as an industrial center. It is peopled by workingmen and workingwomen. Of all persons employed in the city 60 per cent are skilled or unskilled laborers in the industries. Industry is a basic source of livelihood of the rapidly growing population. There are metal works, brick and tile, leather, textile, orange case, printing, artificial teeth, fruit juice, and other manufacturing plants giving employment to the 70,000 artisans and workers of the city. All of these are Jews. One-third of all Jewish workers of Palestine live in Tel Aviv.

A CULTURAL CENTER

Compulsory education is not provided by Palestine Law but in Tel Aviv large sums (about $5,000,000) are spent yearly on the education of its youth. The city supports forty-five kindergartens, ten elementary schools, six high schools, a teachers' seminary, four vocational training schools, two conservatories of music. In addition evening classes and lecturers are provided for those employed during the day.

The city has excellent libraries, and has provided for the development of art in all its phases—opera, theater, music, and painting.

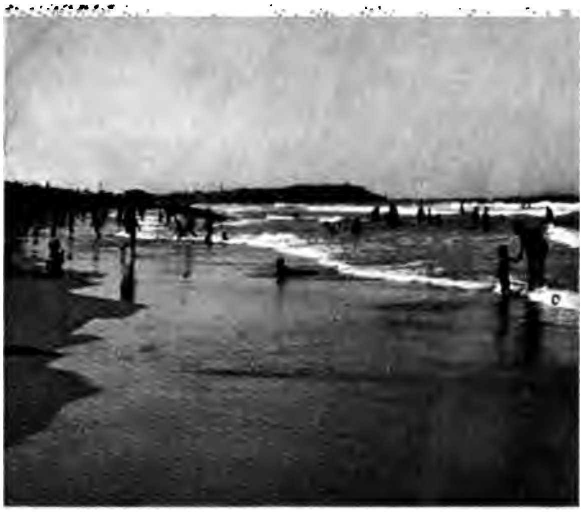

FIG. 4. Looking south along bathing beach of Tel Aviv. Jaffa is in the far-distance.

The large publishing houses of Palestine are located in Tel Aviv. These supply literature both original and translated. Two daily newspapers and several weekly and monthly periodicals are issued. Every phase of political, social, and literary thought is represented.

In Tel Aviv an intensive cultural life is simultaneous with its phenomenal physical and economic growth.

A RECREATIONAL CENTER

Tel Aviv is not only a city of creative work but also a city of recreation. It is a sea-side city and is destined to become a recreational and a health resort for Palestine and for travelers from all parts of the world. The climate is so favorable and invigorating that people flock to the town because of its position on the seashore. The temperatures during the warmest months are ameliorated by the cool steady winds from the Mediterranean. The bathing season lasts for more than six months and already this modern holiday resort is being called the Riviera of the Near East.

POPULATION

Tel Aviv is a boom town—a sand dune area in 1909, in less than three decades a thriving city approaching 150,000 in population. It is a city of youth. Due to pressure upon them, these immigrants have come from various countries. They constitute a real assembly of the Diasporas.

Except for a few brief periods the town has experienced a steady growth in population. It was almost destroyed by the World War being entirely evacuated in 1917 and remaining depopulated until the British occupation of the country in 1918. Problems of unemployment resulted in a decrease in population during 1926 and 1927.

Tel Aviv contains almost 30 per cent of the Jewish population, and 8 per cent of the total population of Palestine. In Tel Aviv, all positions whether social or industrial are held by Jews and here they have proved their ability to direct every phase of industry or society.

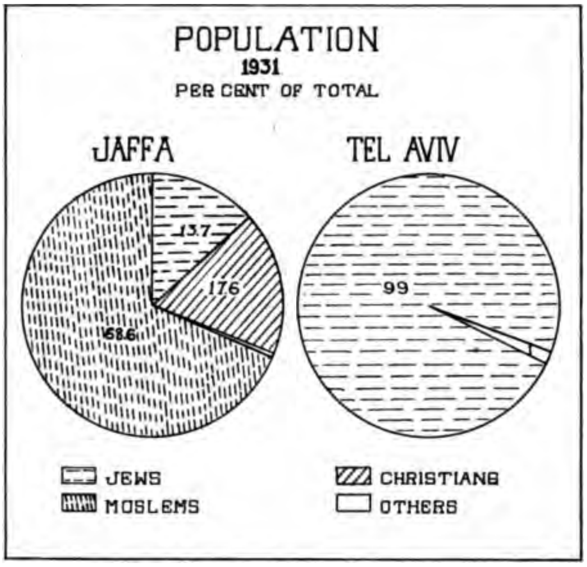

Fig. 5. The division of inhabitants in terms of religion is graphically presented in this diagram.

A New Port

Good transportation is essential to the development of a city. The greater the advantages for transportation the more rapidly the growth of an urban site is stimulated. Jaffa, with a notoriously bad and dangerous harbor, has served as a seaport for Tel Aviv. Recent conflicts with the Arab sailors at the port have led Tel Aviv to make a beginning at the development of a seaport of its own. Altho it has a poor natural harbor the zeal of Zionists will doubtless improve it, even at great cost, in order that they may have unhampered shipping facilities.

TIMBER LINES

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There is much confusion among college students as to the meaning of "The Timber Line." All too often it means to them that one kind of tree changes to another. It is hoped that this brief article may make the term as definite as possible.

The term "Timber Line" means that trees give way to shrubs, bushes, grass, or to no vegetation at all. This they may do for several reasons.

THE COLD TIMBER LINE

There are two cold timber lines, one produced by high altitude and the other by high latitude. The high altitude timber line is around 15,000 feet at the equator. From this elevation of 15,000 feet it descends as one moves toward the poles. In the Rockies of Arizona and New Mexico it is about 11,000 feet, in Colorado between 11,000 and 12,000 feet, in Montana between 7,500 and 9,000 feet and it lowers progressively in the Canadian Rockies until it reaches sea level near the mouth of the Mackenzie River. The amount of moisture in the air changes these figures somewhat so that they cannot be taken as absolute.

The cold timber line produced by high latitude in North America extends from the mouth of the Mackenzie River southeast to Hudson Bay at about Latitude 59° from whence it runs practically due east across the Ungava Peninsula to the Atlantic. In Alaska the tree line is quite complicated but one may say that the northern and western coasts of Alaska and its northern interior are without trees. In Europe there is a narrow tundra across northern Scandanavia and Russia which upon reaching Asia becomes much wider, perhaps 500 miles on the average. The continents of the southern hemisphere have no timber line due to high latitude with the exception of Antarctica which has no trees at all. Conditions of moisture, acidity of soil, and nearness to oceans make many variations in this cold timber line.

THE DRY TIMBER LINE

Another timber line is that produced by aridity as vegetation approaches the edge of a desert. This cannot be stated definitely because it depends upon the distribution of rainfall, the rate of evaporation, and other factors. However, the 20 inch rainfall line usually marks the change in vegetation from trees to shrubs and grass.

THE WET TIMBER LINE

There are certain types of trees like willows, mangroves, and cypress which will grow with their roots in water but all trees must eventually stop when they reach water bodies.

TIMBER LINES PRODUCED BY SOIL AND ROCK

Trees will grow with an astonishingly small amount of soil but there are large areas in northern glaciated areas which are bare rock. Only in depressions where a little soil has accumulated can trees be found.

THE CULTURAL TIMBER LINE

I wish to propose another type of timber-line, the "Cultural Timber Line." In Semple and Jone's *American History and Its Geographic Conditions*, page 158 a map shows the progress of the frontier westward. Cannot one think of the forest as falling before this sweep of settlement? Each successive line of advance can be thought of as the cultural tree line for that period, the last stand of the forest before the axe of farmer or woodsman. The cultural tree line is not as clearly defined as the timber lines produced by other factors, but nevertheless it exists.

NOTE

"I think the interest-stimulating devices are a very helpful part of the JOURNAL." Similar expressions of appreciation come to us frequently. You can cooperate. Send descriptions of your interest-stimulating devices to the JOURNAL. We will be pleased to pass them on as an aid to others, thru the pages of the JOURNAL. There must be hundreds of teachers who have worked out these aids in teaching. Make your description brief, clear, and exact so that another teacher may follow your directions. Send your devices at once as our files are now empty.

Editor

PLANNING AND CONSERVATION

Owing to the great importance of our natural resources and their conservation, and as an aid to those interested in teaching or carrying on research, we are pleased to continue the announcement of material. A former announcement under this heading will be found in the JOURNAL for April, 1936, p. 157. Since most of this material is published by the government, it may be obtained thru members of Congress. However, some of it may be secured only by purchase. We are especially indebted to Dr. Helen M. Strong of the Soil Conservation Service, U. S. Department of Agriculture, for assistance in preparing this reference material.

Nearly all publications may be purchased from the Superintendent of Documents, Washington, D.C.

1. **The Western Range.** 620 pp. Senate Document No. 199, 74th Congress, 2d Session, 1936.
2. **Public Works Planning.** 221 pp. Supt. of Documents. 1936. 60 cents.
3. **National Resources Board Report.** 455 pp. Illustrated. 1934. $3.25.
4. **Soil Defense in the Piedmont.** Farmers' Bulletin 1767. U. S. Dept. of Agr. 1937. 15 cents.
5. **Gullies: How to Control and Reclaim Them.** Farmers' Bulletin 1234. U. S. Dept. of Agr. 1935. 5 cents.
6. **Cover Crops For Soil Conservation.** Farmers' Bulletin 1758. U. S. Dept. of Agr. 1936. 5 cents.
7. **Stop Gullies—Save Your Farm.** Farmers' Bulletin No. 1737. U. S. Dept. of Agr. 1934. 5 cents.
8. **Using Soil-Binding Plants to Reclaim Gullies in the South.** Farmers' Bulletin 1697. U. S. Dept. of Agr. 1933. 5 cents.
9. **Farm Terracing.** Farmers' Bulletin 1669. U. S. Dept. of Agr. 1935. 5 cents.
10. **The Use of Bluegrass Sod in the Control of Soil Erosion.** Farmers' Bulletin 1760. U. S. Dept. of Agr. 1936. 5 cents.
11. **Strip Cropping to Prevent Erosion.** Leaflet No. 85. U. S. Dept. of Agr. Soil Conservation Service. 1931. 5 cents.
12. **Conservation Farming Practices and Flood Control.** Miscellaneous Pub. No. 253. U. S. Dept. of Agr. Soil Conservation Service. 1936. 10 cents.
13. **Our Soil—Its Wastage—Its Preservation.** Region No. 7 (Nebraska-Kansas-Oklahoma) Salina, Kansas. U. S. Dept. of Agr. Soil Conservation Service. 1936. 5 cents.
14. **Groups of Plants Valuable For Wildlife Utilization and Erosion Control.** Cir. No. 412. U. S. Dept. of Agr. 1936. 5 cents.
15. **Report of the Chief of the Soil Conservation Service. 1936. U. S. Dept. of Agr.** Soil Conservation Service. 10 cents.
16. **Forestry and Permanent Prosperity.** Miscellaneous Pub. No. 247. U. S. Dept. of Agr. 1936. 5 cents.
17. **Ten Billion Little Dams.** Soil Conservation Service. U. S. Dept. of Agr.
18. Henry M. Eakin, **Silting of Reservoirs.** Technical Bulletin No. 524, U .S. Dept. of Agr. 1936. 40 cents.
19. C. E. Ramser. **Erosion and Silting of Dredged Drainage Ditches.** Technical Bulletin No. 184. U. S. Dept. of Agr. 1930. 25 cents.
20. Lyman Carrier and Walter V. Kell. **Strip Cropping.** SCS-TP-2. 11-1-35. U. S. Dept. of Agr. Soil Conservation Service.
21. H. H. Bennett. **Soil Conservation.** An Address before the Forty-first Annual Session, Illinois Farmers' Institute, Belleville, Ill. Feb. 20, 1936. SCS-MP-7. 5-1-36. U. S. Dept. of Agr. Soil Conservation Service.
22. Lyman Carrier. **Improvement of Permanent Pastures.** SCS-TP-3. 1-1-36. U. S. Dept. of Agr. Soil Conservation Service.

23. H. H. Bennett. **Utilization of Small Water Powers.** A paper written for the Third World Power Conference, Washington, D.C., 1936. U. S. Dept. of Agr. Soil Conservation Service.
24. H. H. Bennett. **Soil Conservation and Flood Control.** An address delivered at the Annual Meeting of the New York State Society of Professional Engineers, N. Y. City, May 23, 1936. U. S. Dept. of Agr. Soil Conservation Service.
25. H. H. Finnell. **Prevention and Control of Wind Erosion of High Plains Soils in the Panhandle Area.** U. S. Dept. of Agr. Soil Conservation Service. 1936.
26. Lyman Carrier. **Grass in Soil Erosion Control.** SCS-TP-4. 1-1-36. U. S. Dept. of Agr. Soil Conservation Service.
27. H. H. Bennett. **Outline of Investigations and Summary of Results: 1930-1935, Red Plains Soil Erosion Experiment Station, Guthrie, Okla.** SCS-AP-6. 2-1-36. U. S. Dept. of Agr. Soil Conservation Service.
28. H. H. Bennett. **Wildlife and Erosion Control.** An address presented before the National Association of Audubon Societies N.Y. Oct. 29, 1935. SCS-MP-9. 5-15-36. U. S. Dept. of Agr. Soil Conservation Service.
29. H. H. Bennett. **Soil Conservation and Flood Control.** An address given before the Connecticut Engineering Congress, Bridgeport, Conn. July 25, 1936. SCS-MP-11. July, 1936. U. S. Dept. of Agr. Soil Conservation Service.
30. H. H. Bennett. **Soil Defense in the South.** An address given before the North Carolina Improvement Association, High Point, N.C., Feb. 13, 1936. SCS-MP-8. May, 1936. U. S. Dept. of Agr. Soil Conservation Service.
31. C. E. Ramser. **Outline and Summary of Engineering Experiments on Erosion Control on the Ten Soil Erosion Experiment Stations.** Div. of Research. SCS-EP-1. Jan., 1936. U. S. Dept. of Agr. Soil Conservation Service.
32. H. H. Bennett, **Management and Use of Agricultural Lands Including Farm Woods and Pastures.** SCS-MP-13. Sept., 1936. U. S. Dept. of Agr. Soil Conservation Service.
33. A. J. Pieters. **A Digest of Pasture Research Literature in the Continental U. S. and Canada, 1885-1935.** U. S. Dept. of Agr. Bureau of Plant Industry. Division of Forage Crops and Diseases. Jan., 1936.
34. Dr. W. C. Lowdermilk. **Man-Made Deserts.** An Article from Pacific Affairs. Vol. VIII, No. 4, Dec., 1935. SCS-MP-4. 4-3-36. U. S. Dept. of Agr. Soil Conservation Service.
35. Dr. W. C. Lowdermilk. **Soil Erosion and Its Control in the United States.** A Paper Given in The Plenary Session of The Third International Congress of Soil Science. SCS-MP-3. 11-1-35. U. S. Dept. of Agr. Soil Conservation Service.
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GEO. J. MILLER

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ATHENS: A BALKAN CAPITAL

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Athens has contributed so much to our civilization and culture thruout the ages that, in our effort to pay tribute to it we often think only in terms of the past. We are prone to forget that Athens is a modern capital city thru which courses the life blood of a modern State. A large portion of tourists, travellers and scholars who visit the city every year see only ruins of a former greatness which obscure the present day life and urban developments.

THE GEOGRAPHICAL SETTING

Where an extension of the Pindus Mountains forms a peninsula between the island of Euboea and the Peloponnesus lies the small district of Attica. Its easterly shores are washed by the ever blue waters of the Aegean Sea while on the west are the equally blue waters of the Gulf of Aegina. The terrain of Attica is one of relatively low mountains which because of the steepness of their slopes assume a majesty equal to that of much higher peaks. The agricultural portion of Attica consists of small plain areas fringed with alluvial fans. Here man has pushed his agricultural activities up hill on to the alluvial fans and even on to the mountain sides where he has carved terraces out of the reluctant material.

The largest of the areas is the Athenian plain, which is surrounded by mountains (Fig. 1) except on its southwestern side where it opens on to the Gulf of Aegina. Two important rock prominences, Lykavittos Hill and the Acropolis protrude from the lowland. On and around the latter was founded the original city of Athens while the former reared its heights well out upon the horizon. Modern urban developments have progressed at such a pace that both topographic features are now completely surrounded by row after row of houses (Fig. 1).

Tho not a sea port, Athens has the splendid, natural harbor, the

Piraeus, with which, in early times the city was connected by a protected way.[1] Today a modern highway serves the same purpose, and the growth of population has all but joined the two cities into one.

Nature thruout Greece, and especially in Attica, has always been niggardly of its goods. Paucity of industrial resources has ever been combined with lack of fertile soil. The climate adds, to such disadvantages, a long dry summer season. What sustenance is derived from the soil is wrought with the greatest of human labor. From the earliest times, therefore, the city has been more interested in commerce, trade and government; in which fields of endeavor fairer returns for energy expended could be expected, than in agriculture or industry.

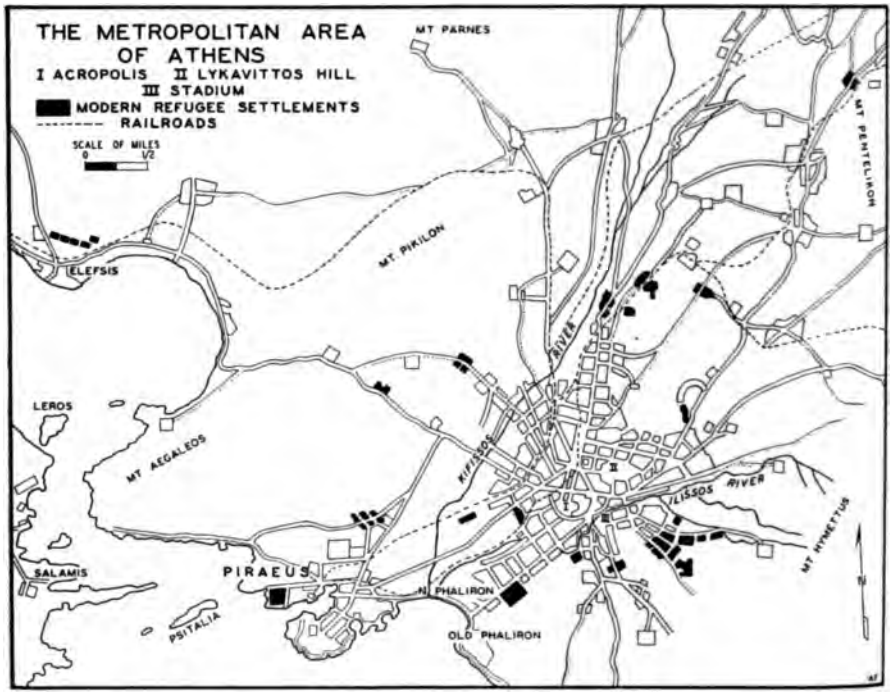

Fig. 1

Altho the physical features of the environment combine to make human life rather difficult, they also combine to create exceeding natural beauty. Athens has one of the most beautiful landscapes in the world—a rare combination of bluest water, cloudless skies and purple-hued heights. When the setting sun casts its light on Mt.

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[1] Ellen Semple, Influences of Geographic Environment, p. 250

Hymettus, the purple shadow there makes it easy to understand why the citizens of Athens long ago referred to their city as "Iostephanos" (the violet crowned).

Across the plain run two rivers; the Illissos River (Fig. 1) which has its head waters on the western slopes of Mt. Hymettus and flows thru the southeastern section of the city emptying into the Gulf of Phalirou, and the Kifissos River which rises in the Parnes Mountains to the north and flows southwest thru the western outskirts of the city, emptying also into the Gulf of Phalirou. Neither has enough water to adequately supply the city. In the long dry summer periods they become mere trickles of water and, in exceptionally dry seasons, disappear altogether.

Lack of water has been one of the problems of Athens since its early days. In the second century A.D. Emperor Hadrian built a now famous aqueduct to the city from galleries driven into the sides of Mt. Pentelikos, until 1926 the sole source of water for the city. With increase in population the water supply, which had always been limited, became critically insufficient, and an American engineering company was commissioned to clean and enlarge the galleries and to erect a dam which would provide an adequate water supply for the city. A large dam of white marble (the cheapest durable material available, for it is quarried near the site of the dam) has been completed at Marathon, on approximately the spot where Miltiades defeated the invading Per-

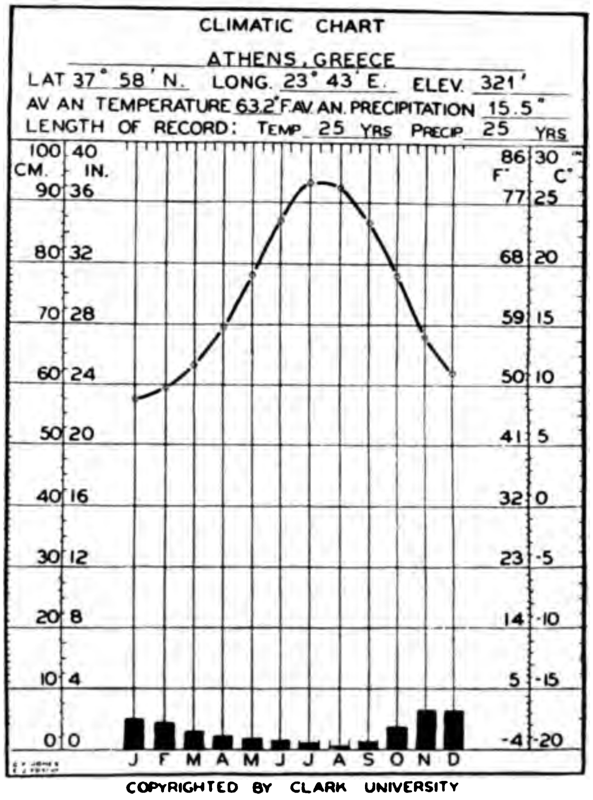

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Fig. 2

sians.[2] The structure impounds a huge lake which supplies ample water for Athens and the Piraeus. The American firm holds the concession to sell water to the city for a period of twenty-five years.

Athens has Mediterranean climate (Fig. 2). The folk of Athens look forward with such eagerness and pleasure to the coming of spring that there, at least, spring begins the year, and all nature responds to the sun's warmth and to available moisture. Every plant is forced to complete its vegetative cycle before summer drought begins, thus producing an abundance of flowers of indescribable beauty—such as is found only in Mediterranean lands. The flower-covered landscape of Athens can be most favorably compared with that of southern California. In addition to their beauty these flowers have some economic significance tho they are not now used extensively.

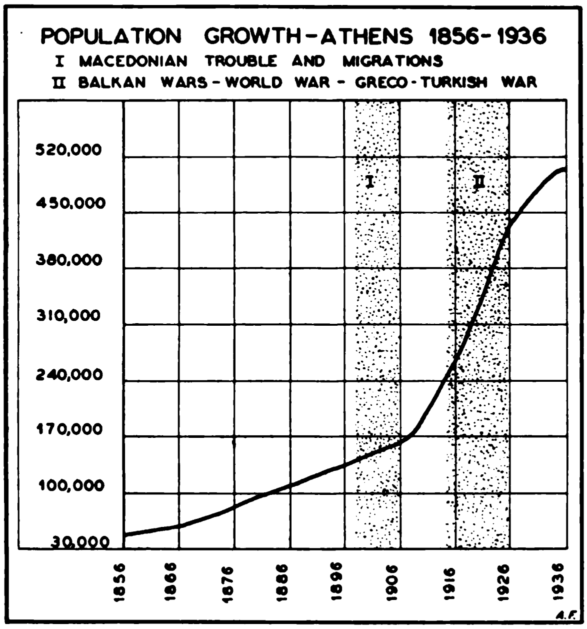

Fig. 3

Spring is followed by a long, hot, dry summer of cloudless skies, when no rain falls, the green of spring darkens into brown or purple, dust fills the air and the temperature rises to 100° F. on the warmer days. In autumn clouds appear and the winter rains follow quickly. Winter temperatures seldom fall below freezing point except on a few occasions when the Etesian winds blow from the north, and light snow falls. The dampness combined with the winds makes the population shiver with cold, and hope for a warmer day on the morrow. The average house of Athens, like those of nearly every other Mediterranean community is not equipped for proper heating in cold weather. The people seem content to shiver knowing that the cold period does not last long.

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[2] Eliot G. Mears, Greece Today, p. 124

The snow at times remains for weeks on the mountain tops, adding another feature of beauty to the landscape, but the city, on the lowlands, being much warmer than the heights, is never under a blanket of snow for more than a few days in extreme cases for generally the snow melts within a few hours.

Urban Developments

Athens has had a most remarkable growth, based partly on normal increase and partly on artificially accelerated migration. In 1856, the city, not including the Piraeus or the Old and New Phalarons contained 30,969 persons. From that time until 1907 it grew steadily being affected somewhat by wars in Europe (Fig. 3). However, in 1920 came the Greco-Turkish War in Anatolia in which Greece met an overwhelming defeat. Following the war one of the greatest movements in history, the so-called exchange of populations between Turkey and Greece[3] was arranged, and directed, by the League of Nations. Nearly two million refugees poured into Greece

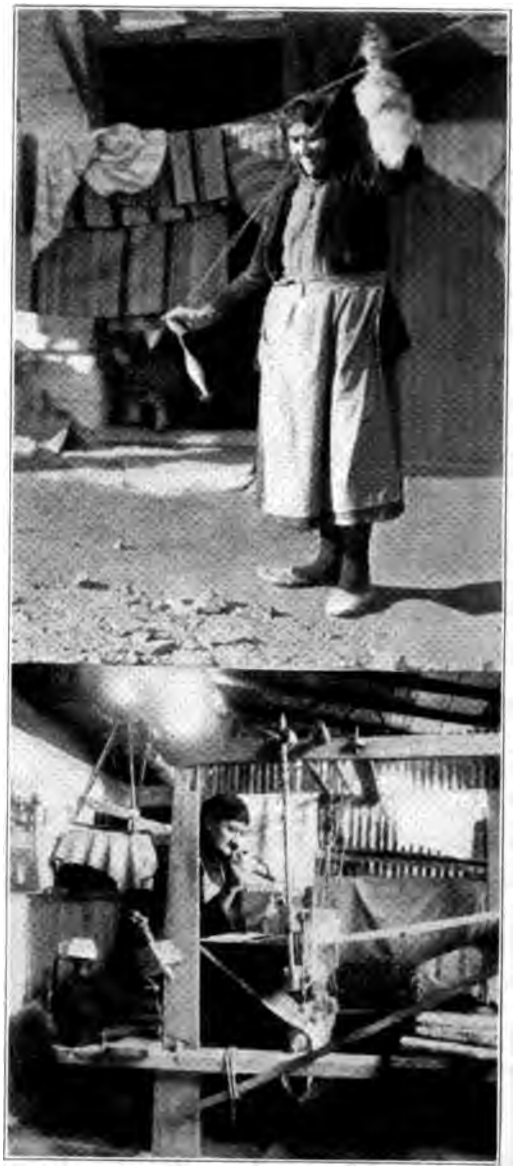

Fig. 4. The refugees who settled in and around Athens brought with them the ability to do industrial work which required skill. While methods are primitive and the work is done mostly by hand (spinning or weaving) the industrial activity supports a large number of people.

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[3] Stephen P. Ladas. The Exchange of Minorities, Bulgaria, Greece and Turkey, Part II, pp. 335-591. A complete account of the details of exchange.

of whom many were sent to Macedonia where, by making the composition of the population dominantly Greek, they solved to a marked degree the "Macedonian Question." However, many of them settled in and around Athens (Fig. 1). Between 1920 and 1928 the population of Athens nearly doubled (Fig. 3). The rapid growth of population placed a tremendous burden upon the Greek government. To house, feed, employ and absorb into the State such a large number of people in such a short time was a most difficult problem. The government, with the help of various charities, constructed row upon row of small houses which it sold to the refugees on long-term contracts. The people who settled in and around Athens were for the most part artisans who possessed skill derived from long experience in their respective trades (Fig. 4) and they markedly increased the industrial activity of the community.

Textile and rug industries experienced marked development after the exchange of populations. Before the Greco-Turkish War, Turkey had built up considerable trade in "Turkish rugs," which had been made chiefly by Greek and Armenian artisans living in Anatolia. With the exodus of the Symrna district, the center of the "Turkish rug" business shifted to Athens where most of the workers had settled.

PRINCIPAL IMPORTS AND EXPORTS OF GREECE
1935

EXPORTS	
Leaf tobacco	$32,231,276
Currants	8,071,988
Olive oil	2,809,668
Wine	1,358,917
Sultana and Rozakia raisins	3,302,379
All others	17,035,194

(Exports to the United States, $11,039,224)

IMPORTS	
Wheat	$12,907,040
Coal	3,817,828
Sugar	2,528,111
Construction lumber	5,054,344
Woolen yarn and thread	2,620,135
All others	71,576,302

(Imports from the United States, $6,154,135)

Source: The United States Consul General at Athens, Greece

Similarly, the textile industry which had always engaged chiefly in the manufacture of short fiber cotton cloth for local consumption,

d its market increased at the same time that its supply of
ed labor was augmented. The resultant expansion of industry
uately supplied the enlarged local market and resulted in an
eased importation of cotton and cotton thread. The silk and
en textile industries also enjoyed some expansion.

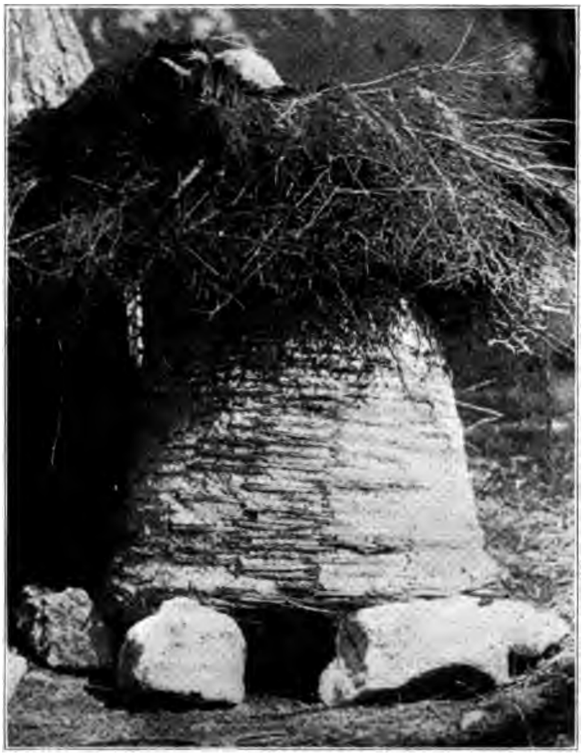

Fig. 5. A close-up view of one of the many bee hives of Mt. Hymettus.

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exports of Greece
anufactured for
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to supplying the
market. The
oil industry, one
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hens for the olive
is common thru-
much of Greece.
tobacco which is
argest single ex-
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es, to some ex-
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cely any of it is
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thens, the capital
ell as the industrial, economic, cultural and commercial cen-
of the Greek Kingdom, is the Paris of the Balkans. Much
s metropolitan character is due to the importation of ideas
funds from the United States. In the past 100 years in-
erable Greek citizens have migrated to this country, become
ens, worked thriftily and saved substantial sums of money to
le them to return to their native land either to retire or to
ge in business. Similarly innumerable American citizens of
ek ancestry send regular monthly checks to their relatives
reece. Importation of American ideas is reflected in the types of
ets and roads of Athens and in displays in shop windows. Such

items of refreshment as ice cream and malted milks which are unobtainable in most other cities of the Balkans are common in Athens.

The agricultural products of the Athenian plain are the chief source of food for the city as well as a partial source of raw material for its industries. The Mediterranean climate besides favoring the growth of grain, the vine, and olives, favors the growth of numerous flowering plants rich in nectar, and eastward from the city, on the slopes of Mt. Hymettus, peasants tend bee hives from which are taken an abundant supply of honey for local consumption. A small export trade has been built up with the result that Hymettus honey is well known in Europe and in America (Fig. 5).

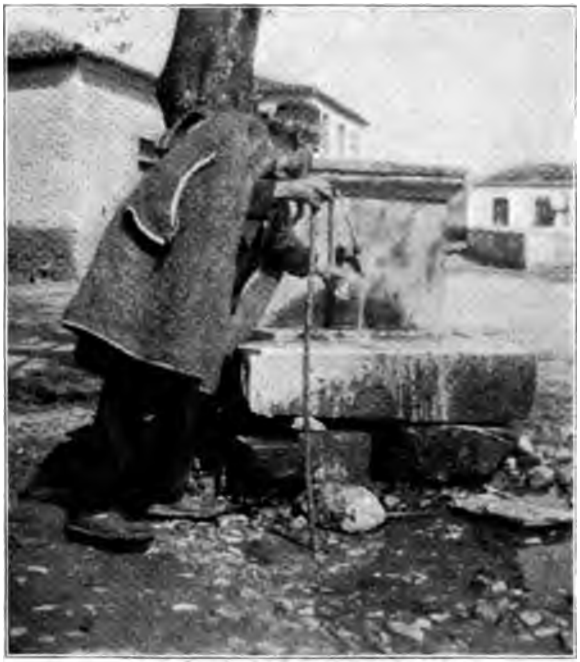

Fig. 6. A peasant of the Athenian plain. Note his crook stick and his cape which is made from the wool of his sheep. Notice his slipper-like shoes.

The peasant of the Athenian plain leads a difficult life (Fig. 6). In spite of his hard work he is unable to provide for himself and family more than the bare necessities of life. His brother, the industrial or commercial worker in the city, is not much better off, for even the skilled labor he does in such industries as the textile, olive and tobacco enterprises enables him to earn but a few cents a day. The average factory workers do not receive more than eighty or ninety cents a day at the very most and many workers earn even smaller sums, from which taxes must be paid and food and clothing procured, to say nothing of housing and other family expenses. Life is possible only by the greatest simplicity and economy. One or two rooms house the average family while the simple fare consists of bread, olives, goat cheese, and perhaps on special occasions, a little mutton. Vegetables add something to the diet but they do not form its basis. Because of the lack of grasses sufficiently rich in feed value, cattle of any kind are scarce and cow's milk and beef are at a great premium, to be afforded only by the upper classes who own or direct the city's commerce, industry or politics.

And yet the life of Athens is not drab. The beautiful setting of the city in itself, contributes something of gaiety, while its wide clean streets, large public parks and gardens afford places of amusement for everyone. In spite of the generally low economic status of the average citizen, the city supports a national theatre, an opera company, and numerous movie houses and national and private museums afford opportunity for study to citizens and foreigners alike. The city which is the home of the National University also maintains a very good system of primary and secondary education. As in ancient days, athletics are popular, especially in the field and track events. The modern marble stadium which stands on the site of the original Olympic games (Fig. 7) is in constant

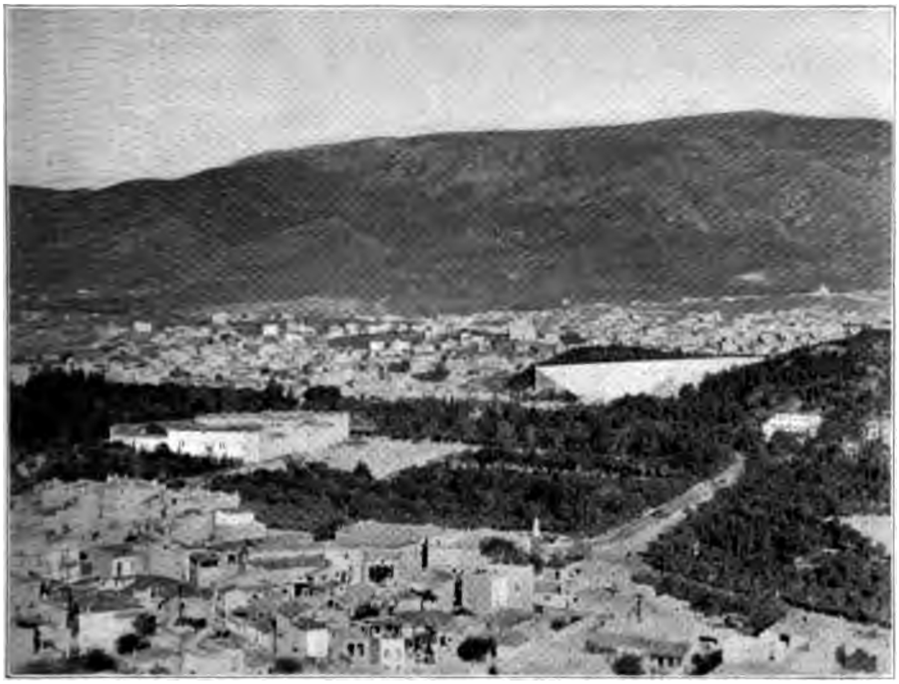

Fig. 7. A view of a section of Athens. Note the alluvial fans on the mountain slope in the background. The modern marble stadium is seen in the center right of the picture while the great public garden, the Zappeion, is in the center of the picture.

use and additional athletic fields devoted chiefly to soccer dot the city.

The daily life of Athens begins early in the morning, long before the rising sun has splashed the eastern sky with pastel color. By five-thirty or six o'clock the whole city is engaged in its business at full force. But, the summer heat is so oppressive that when noon comes, business stops. Metal shutters are pulled down over store fronts, traffic ceases, and the city goes to rest. A visitor arriving at two o'clock on a summer afternoon might justly feel that he was entering a dead city. By four in the afternoon, however, the city is again humming with activity. Business houses, stores and shops remain open until eight or nine o'clock, about which time the evening meal is served in the average home and in all public dining places. After dinner, the various forms of amusement, previously mentioned, occupy the attention of the people far into the night. Sleep for the Athenian comes in two short periods, the noon day rest and the relatively short night period.

As in other Near Eastern cities, the coffee house has played a great part in the lives of the people. Home life as we know it with the family circle, the library, the radio and the fireplace does not exist in Athens. For years the coffee house has in many respects taken the place of the drawing room, for the average citizen. Seated on crudely built little stools men discuss the affairs of the day while sipping very black, sweet "Turkish coffee" from tiny cups.

The people of Greece have always been politically minded and the modern Athenians are by no means an exception to this rule. The topography of Greece originally cradled numerous city-states and today it cradles localized political thought within the structure of the Greek State. Athens alone supports more than a dozen newspapers, each devoted to its own editorial-political point of view. Unlike our newspapers the Greek press concerns itself chiefly with news of political affairs while the feature page, the comic page, the woman's page and the society page are entirely lacking.

Greek being a difficult language and the system of general education being a relatively new institution, the coffee house served as a news dispatching center. Those who could read the papers related the news to those who could not and heated political discussion nearly always followed. According to a recently published Athenian newspaper, the new dictatorship of Greece has forbidden the operation of coffee houses. From a dictator's point of view this is easily understood—free political discussion is never agreeable to a dictatorial form of government, but, it is regrettable that the average citizen should be deprived of one of his chief pleasures. What form of social intercourse will arise as a substitute remains to be seen.

CONCLUSION

The geographical environment of Athens—its pleasant climate, its position near the sea, its enveloping, low lying mountains, its flat plains and their outcropping rocks, its relation to the rest of Greece and its native vegetation—has thruout the ages given the city stability and endurance. Periodically one geographic element comes into greater importance than the others, but, changing conditions cause it to fade into the background and another arises. Always the geographical elements combine to provide protection, as in the days of the city-state, or industrial, commercial or agricultural advantages as in modern times. Athens is the natural center of government, commerce, industry and business and these its people have united into a metropolitan atmosphere unique in southeastern Europe. It is truly the Paris of the Balkans, combining as does Paris, France, the most modern of the cultural, economic, and spiritual elements of the country.

MAKING THE TEACHING OF GEOGRAPHY EFFECTIVE*

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Kent State University
Kent, Ohio

In geography work we are more fortunate than workers in most sciences in that we always have our laboratory with us. I happen to be teaching now in northeastern Ohio and have Akron, a busy manufacturing city, almost at my front door. Its crowded streets, its tall buildings in the down town district, its huge rubber factories, its factory residential districts, as well as its sections with estate-like homes, provide me with a very fascinating laboratory in which to work. I shall draw upon this laboratory for my examples.

In all my experience with pupils in the grades, in the junior high school, and in college classes, I have found three guide posts of great help to me in making my geography teaching effective.

Importance of Reality in Effective Teaching

I like to think of the first guide post as carrying just one word, *reality*. If I can make the region or place we are studying as real to my pupils as the places and people they see every day, then one of my major problems as a teacher has been solved. What are these things which must be made real and how do I accomplish this phase of the work? Of course, before I can hope to make the things in the landscape, both man made and natural, real to my pupils, they must be real to me. I must prepare myself for my teaching by first visualizing the outstanding cultural or man made characteristics and the natural features and conditions of any region or area I wish to present to my pupils. For example, if the study of Akron is to be made real, I must see in Akron a city with crowded streets, tall buildings, and many factories. I must see many of these factories as a special kind of factory, namely those in which the manufacture of rubber is dominant. Airplane pictures of Akron might supply me with these data and help me to visualize the city just as I can actually do in field work of a reconnaisance type.

Significance of Discovering Reasons

On my second guide post is another single word, ***reasons***. Similarly, if I wish to guide my pupils to find the reasons for the ways of living and the kinds of work people are doing in the lands they study, I must myself first discover such reasons. For example, when I find out that there are twenty large rubber factories in Akron in which every form of rubber from rubber bands to balloons and dirigibles is made; where 125,000 automobile tires are made daily; and in which a large share of the workers of Akron are employed, I search to discover facts which will help to explain why Akron is the great rubber center of the United States. There are always three types of factors which I investigate to help solve my problems. These are first, the factors of the natural environment, second, factors in the cultural environment and third, factors that have to do with the nature of the people themselves, their insights, abilities, and attitudes.

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* Presented before the Geography Section, Wisconsin Education Association, November 6, 1936.

To answer why Akron is the rubber center of our country, I investigate the natural setting which men had to use to develop the city. Akron is in northeastern Ohio between the Cuyahoga River which drains to Lake Erie and the Muskingum draining to the Ohio. There was a gap in the water route here which handicapped direct water transport from the Ohio River to the Lake. To overcome this handicap men constructed the Ohio Canal so that this cultural environmental factor, the canal, was added to the natural setting, which included likewise falls in the Cuyahoga River which could be used for power. Factories in the town used native clays from nearby deposits making bricks and other clay products. The fertile farmlands nearby furnished oats and other grains for the mills which made use of the power from the falls. The Canal was used to bring in coal from the Appalachian coal fields not far away—another factor in the natural environment. Then railroads, a cultural environmental factor, followed the route of the canal, and Akron had three main railroads to give it excellent rail connections. The insight of Dr. B. F. Goodrich helped him in 1869 to decide on Akron as the place to erect his rubber plant which he wanted somewhere west of the Appalachian Mountains. In Akron he found the people who could and would help him with the money he needed to build his factory. Thus another cultural environmental factor enters into the interpretation—the capital available. Of course, the process of vulcanization had already been discovered by Charles Goodyear—still another cultural environmental factor. At first bicycle tires, heels, soles, beltings for machinery and other rubber products were manufactured. Other concerns located in Akron as often happens after someone has made a successful start. It was not until the decade 1910 to 1920, however, that the big change took place. In this period, the population tripled and the wage earners in factories went from almost 16,000 to 65,000. The cultural environmental factor that helps to explain this change was the demand for tires for the rapidly growing automobile industry. Akron has the natural advantage of not being far from the heart of the automobile industry. Taking into consideration the advantages of its railroad connections and of the nearby deposits of coal from the Appalachian coal fields as well as such local advantages as plentiful supplies of clear water from many fresh water lakes near the city, we can see some reasons why Akron, with its early start in the rubber industry, is the great rubber center of this country. This brings out the three types of factors mentioned earlier. The nearby deposits of coal, the fresh water lakes, the falls, the gap between the rivers are factors in the natural environment. The railroad connections, the capital, the invention of vulcanization, the canals, are samples of cultural environmental factors. Whereas the insight of Dr. Goodrich and of those who helped him typify the importance of consideration of the nature of the people in the development of this industry. In order to find these reasons I had to investigate many sources but it is an example of the preparation which I must make before I can hope to guide pupils to find reasons. In many cases the maps, pictures, statistics, and reading matter in our textbooks contain these facts and we do not need to do the type of research and investigation ourselves which is represented in the above findings about Akron.

CONSIDERATION OF BACKGROUND OF PUPILS

Thus far, I have spoken only about my preparation for guiding pupils to think geographically. Without such preparation, however, I have found that I can not do effective teaching whether it be at the fourth grade level or in college. Before I speak more about how to guide the pupils I need to, myself, follow the directions on my third guide post which says, *background.* I must know the past experiences of my pupils before I can direct their activities. I must know what map reading abilities they have, what landscape reading abilities, what technical and semi-technical language reading abilities they have, what ability they have to reason in terms of given geographical ideas and understandings, and what ability they have to apply such ideas in coping with new situations in every day living, and whether they have acquired the habit of so doing. This may sound rather formidable. It is not, however, for our guidance means to introduce these informally. A beginning fourth grade child does not possess any of these abilities and could not be expected to discover the reasons by himself, presented in the little study of Akron. His background for such reasoning must be developed gradually. Our guidance should help pupils to gain these various abilities thru providing experiences which will help them to become more and more independent in their use of the various tools at their disposal. I have found in my college teaching that my pupils do not have the landscape and map reading abilities which they need to do effective geographical thinking. A population map is something which they look at but do not read thru to the actual landscape. Therefore they need experiences which will make this map real. When the population map shows that the region of rainy tropical climate has from less than one, or from one to eight, or from eight to sixteen people to the square mile, we translate these facts into number of houses per square mile. Before this takes on real meaning, we need to have a square mile in mind. Our school campus covers approximately 100 acres and when we think of almost 6½ times that area without a single habitation or with 2, or at most, 4 houses on it, we get a real feeling of sparse population. By such experiences we supply that part of the background which earlier experiences had not given. Similarly we can not understand, in these college classes, what it means for this rainy tropical climate to have 80 to 100 inches of rainfall annually, if rainfall has not been made real to us. When I ask these college students how much rainfall we have in a year in northeastern Ohio, they either have no idea or vary in their ideas from 10 inches to 100 inches. "How much rain falls here in a single shower?" is another question they can not answer. These college students differ in their ideas from less than an inch to six inches for one shower. These students have never had the experience of putting out a tomato can or other straight sided vessel and themselves measuring the rain that fell in a particular period, that is rainfall has never been made real to them. When the rainfall of their home region which they have experienced is expressed in terms of distributions and amount, they have a sort of measuring stick to use to help visualize the rainfall of other regions by comparison and contrast.

I have spoken thus far only about my own preparation for teaching, first how I make the region real to myself and second, the reasons for the outstanding cultural characteristics of the region. The third consideration which is really a part of my preparation is knowing the background of my pupils.

BACKGROUND OF JUNIOR HIGH SCHOOL PUPILS

This consideration of the background of my pupils brings me to the subject of the junior high school work. What is the background of junior high school pupils? Of course this varies from place to place depending on the work of the elementary school. If the work of the elementary school has been successful, we might expect our junior high school pupils to have some of each one of the five abilities mentioned earlier.

They should be able to use all types of semi-pictorial map symbols, as well as the more abstract symbols such as those on color band, dot and spot maps. This means that they would be able to use all types of maps except iso-line maps such as contour maps, those using isotherms, isohyots, isopleths. They would be able to read practically all cultural and natural landscape features since their study would have taken them into all countries of the world where they would have seen the various types of land uses. There will be some technical and semi-technical terms which they may need to add to their language reading abilities such as alluvial fans, balance of trade, and a few others. They will have some ability to reason in terms of geographical understandings and to apply these ideas to every day living. For example the 7th grade boy who criticised the statement, "The sea has made Britain famous," by saying, "To give the sea all the credit while coal and man step aside isn't fair" showed that he could think in terms of geographical ideas and would be able to apply this type of thinking in his reactions to such everyday problems as the Great Lakes Waterway. This statement about the sea was taken from a senator's argument for that project.

PRESENTATION SUGGESTIONS

Many of our pupils come to junior high school without these abilities. Therefore the junior high school teacher's problem is to provide activities which will make up for the lack of earlier experiences along this line. This does not mean that the same materials should be presented to junior high schools pupils as to those in the elementary school but it does mean that the junior high school teacher must take special pains to provide for the reality and reasons guide posts. In most of the seventh grades in junior high school the work consists of the study of certain political regions completing the cycle of regional study. In the eighth grade, however, and in the ninth or later senior high school work the geography work generally trys to develop understandings of world distributions. Before briefly sketching a blue print lesson plan of this second type of junior high school or high school unit, I might state a few guiding rules for presentation. First, since all teaching is guidance, the teacher's task is to provide for activities thru the exercises which she sets up. Some of our books do that for us. Where that is missing the teacher may be helped by the following suggestions. In the initial exercises, direct the attention of the pupils to the outstanding cultural characteristics of the region or of the pattern of distribution to be presented. If these outstanding cultural characteristics are brought out sharply, they should arouse the pupils to asking "why" questions or setting the goal for study. When the goal has been set and the pupils know what it is they are going to do, the teacher must provide both the exercises and materials for the work to continue. The text usually supplies all the materials, to be sure sometimes widely scattered. The teacher who in her own preparation has found reasons for the outstanding cultural characteristics knows to just what maps, pictures, grafs, reading matter, etc., in the text, to direct her pupils. She needs only to set up an exercise or exercises by which the pupils themselves will discover what she knows will help solve their problems. To expect children to search thru a great mass of material first in one source and then in another, perhaps materials very much alike, is, in my opinion, a very wasteful process. If the particular text does not contain the material needed, the teacher will find it not only time saving but also more satisfactory if each member of the group, is directed to specific maps, pictures, reading matter, so that each pupil will find the reasons within the comprehension of the class. I cannot overemphasize the importance of this, because so frequently where one child finds one reason, another, another, etc., the child develops that warped type of thinking represented in the statement made earlier—"The sea has made Britain famous." Comparing and checking lists of factors discovered and discussing how these apply, will provide for socialization and build up in each child his ability to do the type of thinking we are after. Finally, in summary exercises those essential cultural items which characterize the region or distribution, and the factors which help to explain this characterization need to be pulled together.

I have found that I have much the same problems in my freshman college classes as I had with my junior high school pupils, namely their background has been such that I must provide at the same time that the work of the college level is being presented those experiences they need to really understand their work.

AN EXAMPLE OF EFFECTIVE GUIDANCE

The following exercises which I would use with a junior high school class working on a unit on rubber may show how the preparation and guidance principles stated earlier may be applied to a specific case.

We are going to begin our study of rubber in the city in our country where more rubber goods are manufactured than in any other city in the United States. It is Akron in northeastern Ohio—often called the "rubber capital" of our country. Find Akron on your maps. Let us see what this airplane view of Akron tells us about the city. Did you notice the many tall buildings and busy streets as well as the many factory buildings?

This airplane view shows more clearly one of the twenty large rubber plants in Akron where rubber goods ranging from rubber bands to dirigibles are made. Do the buildings look like those of any other factories you have seen? Did you notice that in some ways they remind you of textile mills, but unlike textile mills, some of the rubber factories in Akron are low and others tall buildings.

Let us look at our maps again to see, from what the legend tells us about size of cities, what we can add to our picture of Akron. What does this map show that helps you to see where labor for the rubber mills is obtained?

In the list of the rubber goods manufactured, tires are the leading item. Over 125,000 tires are turned out each day.

Do not these things make you wonder why Akron is the chief rubber city in our country?

Let us examine the following maps to see if they may suggest some reasons. What does the population map show? The railroad map? The coal fields map? In the following account check the ideas you got from the maps and see what other facts you can find that help to explain the importance of Akron in rubber manufacturing.

The facts you have found so far only deal with our own country.

Before we can truly understand the rubber industry in Akron we must see how work in other parts of the world also plays a part. Besides the factory buildings, the workers, the power, the money to carry on the work, the railroads for transportation, and other facts you have found, Akron must have raw materials to use. From your study of our country does United States produce the basic raw material—rubber? Why not? What does this graf showing "Sources of Crude Rubber Imported into the United States" tell about where most of the crude rubber comes from? What sorts of regions do you remember these to be? Can you picture the workers gathering latex from the well-cared-for rows of rubber trees on a plantation in Malaya? These pictures of Malaya may help you do that. Is there anything that surprises you about where most of the rubber is obtained? Since Brazil is nearer to us than the Far East did you not think most of the rubber came from the Amazon forests? These pictures showing the work of the wild rubber gatherers in Amazonia may suggest a reason. The following reading will help you check your reasons.

How does the crude rubber reach our country? This map shows the routes over which the rubber is shipped and the ports from which it is shipped. What port ships most of the crude rubber? What do you think you would see then in Singapore? How does this picture of a port scene at Singapore compare with what you expected? Over what route do most ships carrying crude rubber to our country come? Do you not wonder why the longer route is used? In the reading on page — you will find some facts to help you. At what American port would you find most of the huge bundles of crude rubber being unloaded? Why?

Before the rubber used in Akron's rubber factories reaches them you see many other workers in different ports of the world have played a part. Without them Akron's whole business life would suffer greatly.

In a similar way other rubber manufacturing districts of the world can be tied into the world pattern of rubber. These few exercises show what I mean by guidance. They are of the kind I would use in working orally with a class, but with slight changes could be used in written guide directions. Whether Akron is at your front door or not makes no difference in so far as using it to provide the starting point for a study of rubber.

TESTING IN GEOGRAPHY AT COLLEGE LEVEL*

Ralph H. Brown
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More time and thought are devoted to the construction of college tests than is ordinarily supposed. An environment unfavorable to longevity of questions on the one hand, and conducive to constant trial with new types on the other, makes the task a time-consuming one.

Worthy ideals or objectives are held forth: The test must be discriminative, valid, reliable, fair—to the subject and to the student. It must be economical of time, not only that of the class but also the instructor's. In a particular instance one or more but presumably not all of these ideals will be realized in practice, depending on the special or temporary factors influential at the time. Tests must be constantly revised in part or in whole; the subject-matter changes or current events may shift topics of emphasis, the teacher improves his presentation, the average level of the class rises or lowers, occasional advantage may be taken of criticisms by a student body now more articulate than formerly, invalid and unfair items are discovered, there may be a strong presumption that fraternity and sorority houses possess copies of earlier tests. The instructor must be continually on guard against the temptation to use old test items and outmoded examinations, however good or useful these were in the beginning.

It is thus apparent that many factors play important parts in the shaping of a test in college geography. No attempt will be made here to classify and evaluate these factors; rather it is proposed to present some questions which have seen recent service in the classroom. These questions are selected to illustrate three testing techniques which seem to possess two advantages. In the first place, the techniques economize time used in test construction. The maps and pictures on which the items are based do not become distributed among the students, and question sheets without them are meaningless. In each case an ample variety of questions are available, allowing judicious substitution of items as necessity demands. In the second place, the methods appear to be adaptable to different levels of geography training.

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* This paper summarizes in part the results of a project aided by the Educational Research Bureau of the University of Minnesota, with Dr. Edgar B. Wesley, adviser, and Miss Olive Mather, assistant.

OUTLINE MAP QUESTIONS

In preparing a test for a class which has studied the larger features of a continent, say South America, effective use may be made of the blackboard outline wall map. Several flight lines with arrows showing the direction of possible air journeys are drawn in chalk at selected points. The separate lines are designated by letters, e.g., A A′, B B′, etc. Assume that three lines are thus drawn: one from the upper Llanos pointing southeastward to the vicinity of Sao Salvador, Brazil (A A′); a second transecting the continent from east to west, say from Iquique to Victoria (B B′); and a third from the vicinity of Santiago to Buenos Aires (C C′). The following questions relate to these possible flight lines: (1) "Assuming a flight from A to A′, name in the order in which they would be observed from aloft, the principal natural vegetation regions." (2) "Assuming a similar flight from B to B′, name successively from west to east the major geographic regions which would be observed." For the third line the question reads: "What changes occur in amount and distribution of rainfall as one proceeds from C to C′?"

These questions are of a factual character, testing the recall of items in assignment and lecture, allowing little opportunity for application of principles but enforcing a broad view of continental geography. The questions can easily be thrown into a purely objective form or made the basis of a more extended discussion depending upon what is desirable at the time and the length of the test of which this series is a part.

Questions testing similar facts could be asked without the cartographic device but there is a general and a specific reason for its use. As a general principle it is desirable to grasp every opportunity for the use of maps in tests since by so doing, preferably early in the course, desirable study habits are formed thru focusing attention upon the teaching tool most closely identified with geography. Specifically, the flight lines facilitate the grading process by localizing the site and by exerting a partial control over the answer. In place of the wall map, the outlines may be traced on the blackboard or reduced to stencil form to accompany the question sheet. In the latter instance, however, a new stencil must be cut in case the teacher wishes to alter the lines or add to their number. Moreover, if a stencil is made the teacher is tempted to use the maps more than once, and copies become distributed among some of the students, thereby invalidating the results of any related test. By use of the blackboard map the life of the question is greatly lengthened. Maps or sketches of this sort, easily prepared and simple in form, offer many possibilities as a basis of test questions.

Testing with Pictures

Pictures deserve a higher place in geography testing than is usually given them. For the presentation of its fundamental concepts no subject depends more upon pictures than geography, notwithstanding which they are usually neglected at examination time. In the majority of cases where they are so used, pictures provide an interesting mental exercise rather than a means of arriving at definite individual ratings.

Granted certain mechanical equipment, there is no valid reason for not using pictures as a part of any searching test over the subject-matter of systematic or regional geography. They fulfill an important educational mission and usually consume a considerable portion of the class time; they are amenable to testing devices and they aid in differentiating the class on the basis of performance; they represent one part of the course for which no cramming is possible, and the class as a whole finds such a test interesting and stimulating, perhaps because of its novelty.

In venturing into the field of picture-testing, several difficulties and dangers must be overcome or avoided. In the first place, the teacher must be willing to spend from eight to ten hours preparing a test which may take up only twenty minutes of class time. Secondly, only a small proportion of the pictures used in class will be found suitable for testing purposes. No simple rules may be given for the evaluation of pictures for testing; it depends in part upon their geographic quality and in part on how the pictures have been used in class. The elements which contribute to a useful picture in geography teaching have been discussd in these pages by Halverson and others;[1] but even the best picture, in the hands of a careless, unskilled or poorly trained teacher may become very ordinary indeed, while an apparently poor picture, rightly used, becomes an important vehicle of instruction. Pictures used in class as a means of entertainment or as a sideshow will not bring satisfactory results in testing.

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[1] See L. H. Halverson. Pictures in the Teaching of Geography, Journal of Geography, Vol. 28, (1929) 357-368; and Lora M. Dexheimer. Picture Study in Geography, 334-340.

In the selection of a picture for testing, one must consider not only its visibility and its geographic quality, but also the degree of prominence accorded it in class and whether or not the view shows too much or too little. The teacher must avoid the dangers of making the test either too easy or too difficult, perhaps unfair, and thus to prevent a normal class distribution. Many pictures, while possessing geographic quality, will be found unsuitable for testing purposes because the scene is so familiar or so readily analyzed that no real problem is presented.

Since successful picture tests, at least in large classes at college level, require a definite control over student responses, the objective type of test is found desirable. The most reliable forms of such tests seem to be the multiple choice, the reverse multiple choice, and the matching type. In the multiple choice types the slides numbered consecutively are shown for a half-minute, the response being made on previously prepared mimeographed sheets, the student selecting one of five choices. The matching test technique is administered as follows: The teacher has already at hand twenty testing slides and copies of a mimeographed sheet on which ten carefully worded descriptions correspond with ten of the twenty pictures. While each picture is in view the students write their own description of the scene, having learned that mere localization or identification is, in this test, insufficient. When all the pictures have been shown the answer sheet is handed out on which the students match their own answers with those previously prepared. An obvious objection to this type of picture test is that it is not economical of class time. Multiple choice tests are handled more expeditiously but require less ingenuity on the part of the student.

This by no means exhausts the possibilities of picture testing. Tests of identification of scene or activity are admissible. Pictures not used in the actual course of instruction may also provide suitable testing material. Students at college level should be able to recognize, in scenes not previously shown, the relative maturity of cultural or natural landscape, a type of culture or drainage pattern, or climatic and physiographic types as revealed by natural vegetation or surface configuration. Grafs, diagrams, and cartograms, often available in slide form with certain portions masked off during the test, add to the range of possibilities.

Functional Questions

Professor Barrows[2] expresses a generally accepted ideal of geography teachers in saying that "the outstanding educational objective of geography . . . is to help make purposeful thinkers and successful doers, not to create animated gazetteers." Geography tests, that is to say, must include functional as well as factual questions. The functional question attempts to provide a situation in the solution of which the student must apply general principles or reason from facts and definitions which have been learned in other connections. Such situations are notoriously difficult to provide.

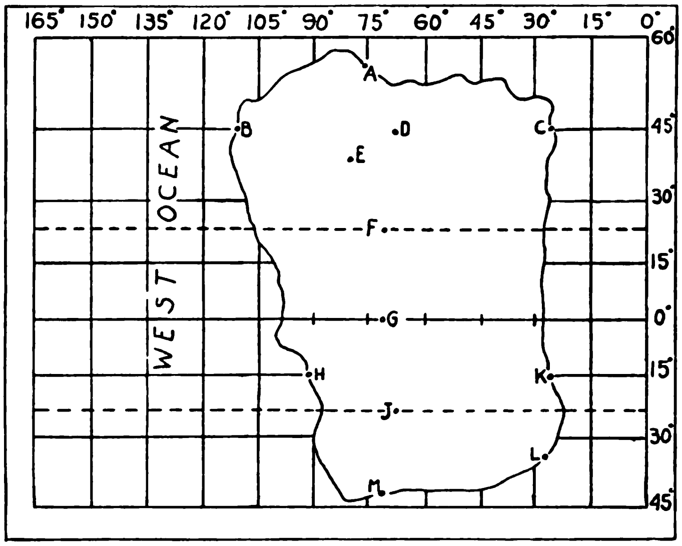

Fig. 1

In the liberal arts colleges, the introductory course variously called Principles, Elements, Introductory or General Geography, has become quite standardized in this country. Topics treat of broad earth or space relationships, map projections and map interpretation, climatic factors and types, other environmental elements and man's distribution and his purposeful activities. It is learned among other things, that there is a tendency toward a systematic arrangement of the great world regions, especially as exemplified by climate and related phenomena.

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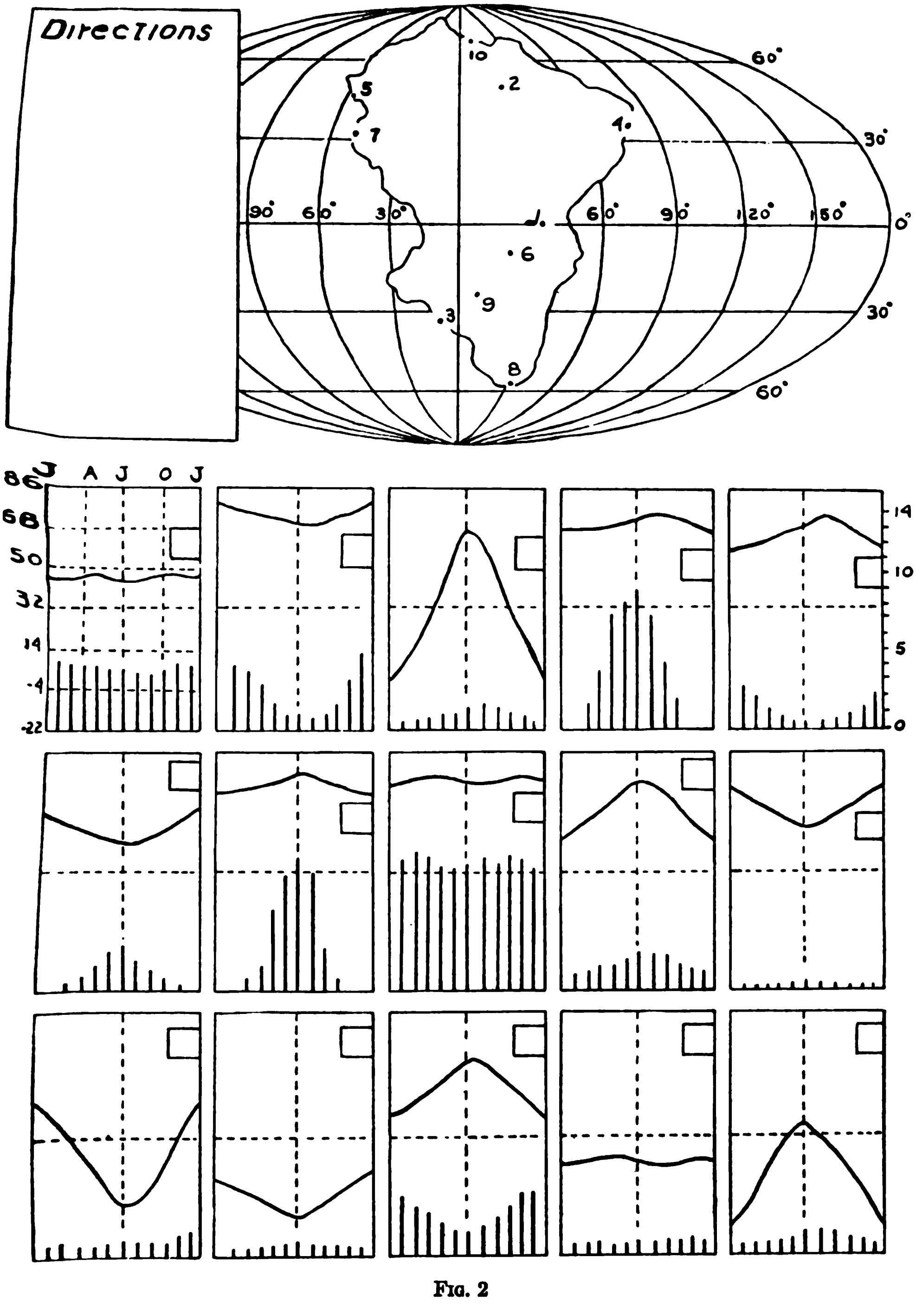
[2] Harlan H. Barrows. Some Critical Problems in Teaching Elementary Geography. Journal of Geography, 30, (1931) 353-364.


Directions
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4.
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150°
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.6
9
.3
8
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A
J
O
J
86
68
50
32
14
-4
-22
14
10
5
0

FIG. 2

The ability of the student to carry over these general principles and broad conclusions to a new situation may be tested by the use of what has been called the imaginary or hypothetical land area. Commencing with a simple case (Fig. 1), the student is told that the map shows "an imaginary continent drawn on a standard map projection. The land area of the continent is presumed to lie at or near sea level, but in other respects it is typical of the actual continents and any general rules which apply to them and their surrounding oceans apply equally to this one." A large number of fair questions may be based upon this map. For purposes of economy of space the questions have been put in multiple choice objective form but essay or subjective questions are equally possible. Here are a few examples:

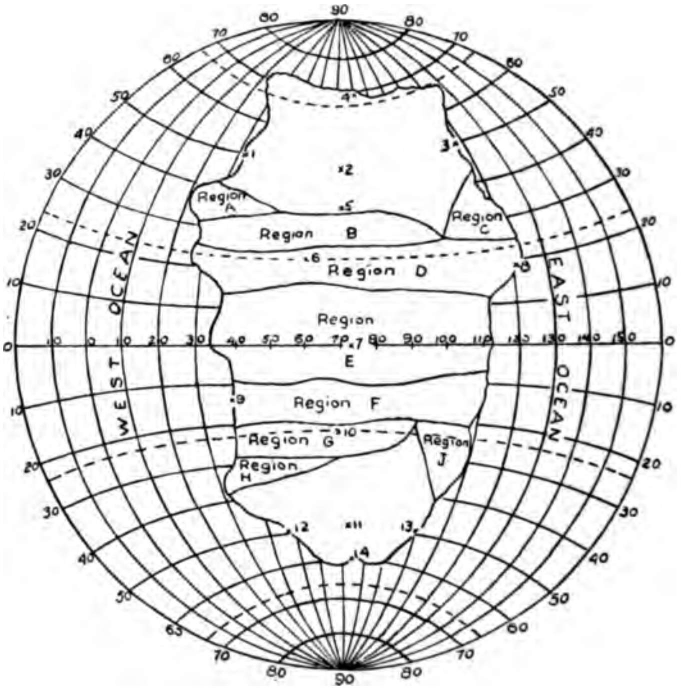


FIG. 3

a b c d e The projection used is (a) Goode's homolosine, (b) Polyconic, (c) Mercator's, (d) Mollweide's, (e) none of these.

a b c d e The approximate distance in miles across the continent at the equator is (in miles) (a) 3000, (b) 3500, (c) 5000, (d) 6500, (e) 8000.

a b c d e The continent lies wholly in the (a) northern hemisphere, (b) land hemisphere, (c) western hemisphere, (d) southern hemisphere, (e) eastern hemisphere.

a b c d e At Place G the sun is vertical (a) only on December 21 each year, (b) at the equinoxes, (c) at noon on the equinoxes, (d) at the beginning of each of the four seasons, (e) thruout the year at midday.

a b c d e Place B would have warmer winters than Place C because (a) B is nearer the equator, (b) B is nearer an ocean, (c) B is on the windward side of the continent, (d) B has longer summer days than C, (e) cold ocean currents flow along the coast at C.

a b c d e Winds at Place L would (a) be highly variable, (b) prevail from the west, (c) prevail from the southeast, (d) be counterclockwise, (e) be none of these.

A few weeks later, following a survey of major climatic types in which liberal use of climatic charts and grafs has been made, the student is prepared to encounter a more complicated problem, but one along the same general lines (Fig. 2). The basis of the test is another land mass, drawn upon a different projection, on which ten places are located by number. Below the map are fifteen climatic grafs depicting possible combinations of temperature and rainfall. The problem is for the student to choose from the fifteen grafs the ten which apply to the numbered places, inserting in the small rectangle within the graf the number of the place whose climate it represents. Twenty-five minutes are allowed for the completion of the test and to do so successfully the student must have at his command a sound knowledge of the principles involved.

The third member of this sequence of tests (Fig. 3) is suitable for part of a final or comprehensive test. The regions outlined represent a composite and generalized picture of the several types of climate to be found in the assignments read by the students in the class for which the map was designed. The map is believed to possess some utilitarian value for the course in which it is used but is, of course, not designed for scientific purposes. In addition to the regions, places are located by number and the land area is drawn on still another projection. About 150 questions have been based upon this map, assuming that some questions similar to those in the preceding tests will be asked. For example, a question on map projection might be:

a b c d e The type of projection used is (a) orthomorphic, (b) stratographic, (c) homolographic, (d) polyphase, (e) hypsoidal.

Many students will choose, to their later embarrassment, one of the likely-sounding coined words in this list. Other questions relate to types of climate, ocean currents, prevailing winds, presumable vegetation formations and major human activities. One of the advantages of such a series of tests, and appreciated by the student, is that those who have failed on earlier questions are later given a chance to make good by solving a more difficult problem. There are, of course, many other types of functional questions designed to test the degree of understanding, mastery and skill which students have acquired.

Functional as well as other questions may be framed either in the objective or in the essay form. As here presented they are objectively stated. This is merely because these questions have been taken from tests originally designed for large freshman-sophomore classes in which no teaching assistants are available. These same tests, it must be added, contained a small sampling of questions of the essay type. In the more advanced classes, with limited enrollments, the essay type of test is more frequently employed. This seems to be in harmony with the general practice in our colleges at the present time.

WHY DO WE HAVE AN INTERNATIONAL DATE LINE?

(A Simple Analysis of the Concrete Day)

ELMER BRILL
Chicago, Illinois

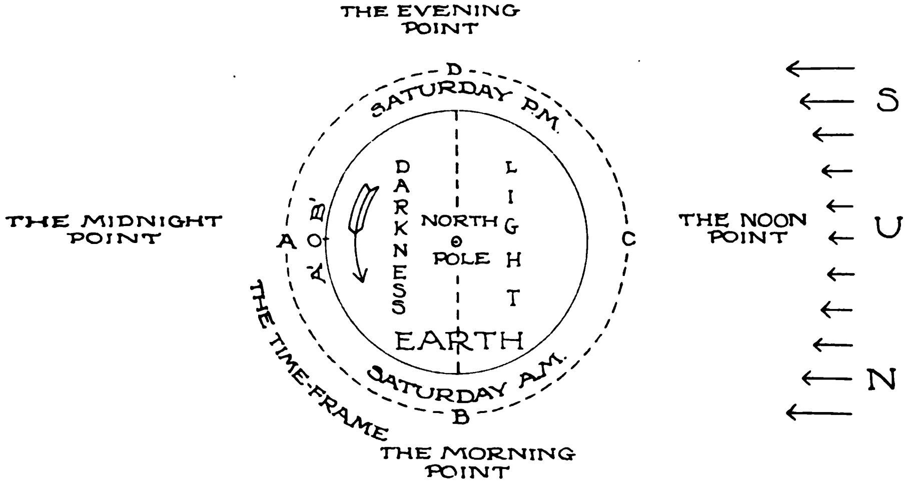
It is very common in scientific thinking to find a certain abstract idea or conception so related to a concrete object or, more especially, position in space that we are able to analyze the idea into certain elements and connect or relate each element to a particular position in space.

TIME: ABSTRACT AND CONCRETE

For instance, the abstract unvarying flow of the idea of time has been divided up into certain very familiar elements such as daylight, darkness, morning, evening, noon, midnight by the spatial position of any certain point on the earth's surface relative to the sun. To be more specific, we could say that the abstract idea of a particular unit of time called a *day* is merely the duration or passage of twenty-four hours but that the concrete or practical *day* we are acquainted with is the division of these twenty-four hours into the elements of morning, evening, 8 A.M., 4 P.M., etc. Mere duration of twenty-four hours is uneventful, and therefore we have no basis for distinguishing its parts; the day of morning and evening is full of distinguishable variations. The twenty-four hour day is quantitative and abstract; the day of morning and evening is geometric and concrete.

THE CONVENTION OF EARLY AND LATE

Altho, primarily, the words "morning" and "evening," denoting *spatial phenomena* (marked by the rising and setting sun), have no meaning in connection with *absolute* time; by convention we are accustomed to consider morning as *earlier* in time and evening as *later*. Therefore it is natural to suppose that the *early* part of the twenty-four hours of abstract time should be called its "morning" and the *later* part its "evening." As a matter of fact, however, it must never be forgotten that sunrise is *early* only because by convention we start the concrete day at midnight. The correspondence between the concrete day and the abstract day is purely arbitrary. The visualization of this *arbitrary* correspondence is perhaps the chief value of the accompanying diagram.



For convenience, when any point coincides with A, the old day for that point ends and the new day begins.

RELATIVITY OF THE CONCRETE DAY

The concrete day is relative to points on the earth's surface. Therefore an *absolute* moment of abstract, uniform time corresponds to *every* possible moment of concrete or relative time, since every point on the earth's surface has at the same time a different portion of that day which is divided primarily by darkness and light. In ordinary speech then, by *day* we mean a day or portion thereof *relative* to a certain point on the earth's surface.

Altho the abstract and concrete must often be wedded in thought, to accomplish this union without confusion is very difficult without some schematic representation such as here given.

For convenience, we assume that the axis of the earth is perpendicular to the plane of the orbit and that we are looking down upon the earth from a position directly "over" the north pole. Let A, B, C, D be *points in space* determined by the relative position of the earth and sun. *Light* and *darkness,* too, (that is, the regions of space *near* the earth's surface where light or darkness reigns) are spatial positions—not something adhering to the surface of the earth. Since this relative position varies but little in a twenty-four hour day, for present purposes we may consider that the spatial frame of points does not vary relative to the earth.

THE STARTING POINTS OF TWO SERIES

Considering the earth at rest for the moment, let A′ be a point on the earth's surface at an infinitely small distance east (in the direction of the arrow) of a certain point called the zero point (which at the time is directly "under" A). Then B′ will be a point on the earth's surface at an infinitely small distance *west* of the zero point. Now when any point on the earth's surface (say A′) moving eastward (in the direction here indicated by the arrow) coincides with A, the portion of concrete (or distinguishable) time applicable to this particular point is called midnight. When A′ coincides with B, we say it is daybreak *for A′* or about six o'clock in the morning. Similarly with all the other points in the concrete time-frame. Therefore the time-frame itself constitutes an identification of the twenty-four hour flow of abstract time relative to points on the earth's surface. The coincidence of a point on the earth's surface with an identifying point on the time-frame constitutes a certain portion of the day for that particular point. Since concrete time is determined by the correlation of two sets of points (namely, those on the time-frame and those on the earth itself) and since we have already selected one of the points on the time-frame (the midnight point) as a starting-point, it is only reasonable to expect that it will likewise be necessary to select another point on the earth as a starting-point. We have here two never-ending series (points on the time-frame and points on the earth) correlated with each other; and we must have a starting-point in both series, just as it is necessary to have a zero point for positive and negative numbers. The whole matter hinges upon the fact that every unending ordinal succession (or series) must have a starting-point which can be only *arbitrary.*

THE CONCRETE DAY CONSTANTLY SURROUNDS THE EARTH

As we have already seen, any particular moment of absolute time corresponds to all possible moments of a complete, concrete day. Therefore, let us again imagine the earth at rest in the position shown by the diagram. With the earth in this position, to each point on the earths' surface is allocated (by virtue of its position) a particular moment (portion) of the concrete day of morning and evening. Starting with any arbitrary moment in absolute time, we can give to this spatial, concrete day spread around the time-frame an arbitrary name of some portion (day) of a larger division (week) of concrete time. Let us say that the day under consideration is Saturday. Then A′ will have just passed from Friday night to Saturday morning, and B′ is just ending Saturday night and ready to begin Sunday morning. It is thus easily seen that when *time is spread out in space,* A′ is twenty-four hours later[1] (in concrete time) than B′ or B′ is twenty-four hours earlier than A′, seeing that there is twenty-four hours difference in time between Saturday morning (or midnight of Friday-Saturday) and Saturday night (or midnight of Saturday-Sunday). With regard to any *certain* point, this difference is an actual difference of abstract time since the two moments applying to the same point are separated by a real *duration* of twenty-four hours while the point is rotating around the entire time-frame; but with regard to *two* points (even tho infinitely close together, such as A′ and B′), the difference in time is not actual *duration* but a purely *nominal* difference due to position in space. While A′ starts Saturday, B′ starts Sunday; and when A′ starts Sunday, B′ is starting Monday. B′ is always twenty-four hours earlier (in the sense of occupying a position on the time-scale more advanced, farther along, or later) than A′. The midnight point starts a new day for every point on the earth's surface in turn. Twenty-four hours later (that is, farther along on the absolute time-scale), when each point has had its day started and the first points are ending that same day, the midnight point starts the *next* day for all the points in turn. Thus every twenty-four hours the midnight point starts a new day for every point on the earth's surface, but the *last* point for which that day is started will only finish that day twenty-four hours later. But since the *first* and *last* points may be infinitely close together (as A′ and B′), which one shall be considered "first" or "last" (as well as the relative position of all the points between) evidently depends entirely upon which point on the earth's surface we choose as the zero point. Since our choice is entirely arbitrary, we may be guided entirely by convenience; and since all points infinitely close (but separated by the zero point) will vary one concrete day in time, we shall find it convenient to have this zero point (or meridian) located in uninhabited parts of the earth or (still better) on the ocean. This zero meridian is called the International Date Line; and since its selection is purely arbitrary, of course it does not need to follow any certain meridian but may run zig-zag or any way convenient.

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[1] In the sense of being farther back in order (or first, therefore *earlier*) on the *absolute* time-scale, implying slowness or lateness in the point itself. But in regard to the portion of *time* applied to the point, it must stand first or earlier on the time-scale and therefore be called *earlier* time.

Points just west of the date line (as B′) will have Sunday morning or Sunday noon while those just east (as A′) will have Saturday morning or Saturday noon (as shown by the diagram)—and so for all other moments (portions) of the concrete day.

A POINT MOVING RELATIVELY TO THE EARTH CHANGES ITS TIME

And now, referring to the diagram, let us imagine the earth at rest in the position shown. If a point on the earth's surface change its position relative to the surface, it will thereby change its moment of concrete time relative to what it would have been had it remained in its original position and also relative to the time that *still* obtains at the original position. In effect we can cause a point on the earth's surface to move by causing a human being to move. If a man at point A′ move eastward until he coincide with C, he will change his portion of concrete time from Saturday morning (just after midnight) to Saturday noon—thereby advancing *his* spatial or positional time and making it *later*.[2] If he makes a complete circuit, he will add a day to his reckoning. Let us imagine that our traveler makes the circuit instantly (since actual time does not figure anyway in this static, spatial arrangement of concrete time), passing from Saturday morning to Saturday evening and gaining twenty-four hours of concrete time. However, upon crossing the date line, the time becomes a day *earlier* (or Saturday morning again), thereby correcting the advance in concrete time caused by advancing along the time-frame relative to the earth's surface.

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[2] Here the local or positional time is arbitrarily related to notions of *early* and *late*, which have true meaning only in reference to absolute time, and "later" is used in the sense of the local time being later in order on the time-scale—the point itself being considered advanced or *earlier*.

Conversely, if a man start at B′ and travel westward, he changes from Saturday night to Saturday morning (twenty-four hours of concrete time *earlier*). But upon crossing the zero point on the earth where Saturday night begins, the time is advanced twenty-four hours later to Saturday night again. Thus, while two points on the earths' surface may have concrete time as much as twenty-four hours apart, the International Date Line prevents the variation being any greater because of movement along the surface of the earth. In other words, it forces the apparent time of the moving point (traveler) to correspond to the actual concrete time of the *fixed* points; or it corrects the traveler's illusion that he is gaining or losing time. Of course the traveler *does* gain or lose concrete time; but, since concrete time has only an arbitrary relation to *true duration of twenty-four hours,* it must not be allowed to vary therefrom more than one day.[3] This can be done by making the traveler's time correspond to the fixed points on the earth's surface. Otherwise, each fixed point would at the same time have an *infinite number* of concrete times (moments), depending on how many travelers had visited it, which direction they had traveled, and how many times they had circled the earth. It is, of course, always the exact *concrete time of the day* that the traveler thinks it is; but if he circles the earth westward, it will be a day *later* in the week and if he travels eastward, the true concrete time (not varying more than twenty-four hours in any case from abstract, absolute time) will be one day *earlier* in the week. The fact that in reality the earth itself is rotating and the further fact that it takes a traveler a day or many days to go around the earth has no effect on the matter other than modifying the amount of real, abstract duration (with which we are not now concerned) necessary to accomplish the process. Concrete time being essentially a spatial and static matter, we may look at it primarily in its static form quite free from complications of motion.

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[3] However, there is always *one* point (varying from moment to moment) that varies twenty-four hours from the *true* (or abstract) time.

GEOGRAPHY IN THE ELEMENTARY AND SECONDARY CURRICULA

In response to numerous requests relative to the position of geography in the curricula of the elementary and secondary schools, the National Council of Geography Teachers presents the following statement, as a possible aid in curriculum construction.

Place and time are basal factors in all human relations. "The earth is the stable stage on which the accelerated drama of humanity is being played. The study of geography beyond the elementary school, to the very end of school and college days, holds out one of the brightest hopes of a saner staging of this drama that vitally concerns us all."[1] Knowledge of the natural setting in which man and nations function and of the part which natural factors play in the interpretation of human affairs are critical elements in the solution of many social problems. Numerous human disasters, such as the destruction of millions of acres of farm land, and the efforts of man to carry humid-type agriculture into arid lands, could have been avoided had our people been informed in the modern type of geography.

We are confronted constantly by international strife. Commonly strife is based upon the need or desire to acquire and control natural resources such as minerals, harbors, rivers, agricultural lands, trade routes, etc. Frequently more pleasant sounding reasons are offered for public consideration. Another basis for international ill-will is ignorance of the every-day problems of living which people face in lands other than one's own. The more one knows of the means of support for people in other lands, the farther he sees into the attitudes and policies in those lands, the less "strange" or "unreasonable" people in those lands seem. "The science of elementary geography contributes without fail, and in a large measure, to those understandings, and attitudes that are the bases of just, harmonious relations between peoples of different countries and of different sections within a country."[2] It is of vital importance that our citizens should possess the knowledge that would enable them to more correctly interpret international relations and human motives.

Geography, like other fields of knowledge, has a contribution to make that is distinctive and which is essential to an understanding of, and to the solution of many human-welfare problems. This potential contribution has been largely disregarded in the American system of education. In this respect many European schools are superior to ours.

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[1] Reference 21, p. 125.

[2] Ibid. p. 133.

Among these contributions may be mentioned the following:

1. Geography in education deals primarily with interrelations between man and his natural or earth environment. Efforts on the part of man to make adjustments to his natural surroundings are universal and involve some of the major problems of man. No other field of knowledge deals systematically with these interrelations.

2. It contributes a knowledge of the specific uses man makes or may make of natural resources and, in so doing, it contributes to a knowledge of climate, soil, surface, coal, iron, oil, forests, harbors, rivers, and other natural features and conditions. Man's effort to utilize natural assets to the best advantage and to cope with natural handicaps, affects his daily life and thinking. No other subject supplies this body of knowledge of interrelationships between man and nature which are so essential to an understanding of human affairs.

3. It contributes to a realization of the interdependence of nations and of regions within a country; it shows how the people in any region or nation depend on people of other regions or nations in their efforts to develop their natural resources, and to exchange resources or finished products. Too often the activities of man are "taught" without an understanding of the natural conditions upon which those activities are based. This commonly leads to a continuous compounding of erroneous thinking.

4. It contributes a knowledge of place, and its associations, as a coordinate of time—both basal factors in the interpretation of human endeavors.

5. It contributes a knowledge of the natural setting that is helpful in understanding many significant facts presented in social studies such as history, economics, and sociology, etc.

6. It contributes directly to an understanding and appreciation of the efforts of man to live better in the natural setting of the region in which he resides. Lack of such appreciation helps to explain many of the strained relations and bitter struggles between human groups that have occurred in the past or exist today. Such a sympathetic understanding is essential to peaceful relations.

7. It contributes an appreciation of the fact that in explaining the evolution of human society, whether sectional, national, or

international, the natural setting in which that evolution took place is one important factor. "There can be no real understanding, appreciation, or effective solution of world problems without recognition of the significance of earth environment in the evolution of human history."

8. It contributes to an "understanding of common human interests in the production of raw materials, their manufacture and marketing; to an understanding of the significance of natural resources in the well-being of people and why those resources are a subject of international discussion."

9. It leads "to a realization that the highest individual success, prosperity, and happiness are dependent upon the existence of similar conditions among other individuals, whether this be within a given local group, within a country as a whole or between countries; in other words, a recognition of the rights of others and the substitution of cooperation for aggression."

Such fundamental knowledge, ability to interpret, and appreciation of man's relation to his earth environment, as are here outlined, are essential to a broad view of human relations thruout the world, and contribute directly to the solution of many group, national, and international problems.

Some schools may find it convenient to develop geographic instruction in accord with one formula and some by another. We hold that excellent work may be done by following any one of various procedures. However, we urge the retention of the distinctive contributions that geography may make, or that it may make more effectively than can any other subject, in any curriculum revision that may be undertaken. We also urge that sufficient time be assigned to any unit so as to develop ability to use geographical materials accurately and to think correctly in terms of information they supply. This requires more than mere superficial information. We also urge that a competent geographer be invited to participate in the preparation of any geographical curriculum.

To make such geographical work effective, adequately qualified teachers are essential. The qualifying standards should, at least, equal the educational requirements in any other field of knowledge. This necessitates thoro preparation of teachers in geography in the teacher training institutions. Curriculum makers should recommend that such training be provided. In some states geographical training of teachers is now far advanced and in those states excellent geography teaching is being done. In other states the geographical work in teacher training colleges is woefully inadequate. Such "below standard" colleges must improve their geographical offerings and their geography teaching staff, before the geographical work of the school system will function effectively. High grade geographical work should not be expected when the subject is taught by teachers who have had no training.

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Approved by the Board of Directors of the National Council of Geography Teachers at its meeting at Syracuse, N.Y., Dec. 30, 1936.

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EDITORIAL NOTES AND NEWS

"International Understanding Through the Public-School Curriculum," is the title of Part II, of the Thirty-Sixth Yearbook of the National Society for the Study of Education. This volume presents material of great interest to geography teachers. The Society's committee, responsible for the Yearbook, had no geographer member, hence it is especially significant that as much space is devoted to geography as to any other single subject in the curriculum. In the school curriculum section 10 pages are devoted to primary work, 16 to English literature, 14 to mathematics, 24 to history (3 articles), 24 to geography (3 articles), 12 to social studies (1 article), 38 to the whole group of natural sciences (3 articles), 14 to modern languages, 8 to the classics, 10 to music, 14 to the fine arts, 8 to physical education, 12 to recreation. Geography is second to none in the emphasis given.

In the Canadian section on Curriculum Practice it is interesting to note that the plan followed is essentially the same as recommended in The Teaching of Geography (Thirty-Second Yearbook). Geography is treated first in 1¼ pages. History is assigned less than 1 page, civics and economics, together, about 1 page, esthetic arts 1 page, mathematics and science ½ page, modern languages ¾ page, and extra-curricular activities ¾ page.

In the chapter on The Preparation of Teachers, Dr. Bagley recommends "that colleges in preparing teachers provide rich courses in geography suited to the abilities and interests of students on the collegiate and university levels." Geography is the first specific course which he recommends.

It is, indeed, encouraging to learn that geography is gaining recognition in American schools, comparable to that given to other subjects. It is especially pleasing to have this recognition come from educators who are not geographers, since they cannot be accused of being special pleaders. There is abundant evidence that geographical education is advancing on a highway of sound foundation, and in a manner that will command and retain respect. Many workers in the field are aware of the constant effort required to direct and hold that advance during the past two decades. The responsibility for sound constructive work in the future is very great. Eminently qualified leaders with vision, who build for years ahead, who are capable of selecting the gold from the dross, are essential. Dr. Bagley's recommendations for adequately trained teachers are vital. Sentimental emotion makes a strong appeal in human relations, particularly in proposed international understandings, and biased regimentation may become the order. Truth must prevail. Sciolism may easily destroy all that has been gained.

The Wallace W. Atwood Fund for Research in Physical Geography

Thru the courtesy of the Secretary of the Association of American Geographers, the following excerpts have been taken from Dr. Atwood's letter announcing his bequest to the Association.

"I have long believed that all those who were interested in the development of geography as a science should be encouraged to carry on field studies. I am particularly anxious to help those engaged in teaching, whose research work is not financed by any state or federal government.

"For this purpose I wish to provide at this time a fund of $2,500, which I shall present to the Association thru you. Five hundred dollars of that amount I wish to have awarded as a research grant at the Syracuse meeting of the Association, and the balance I wish to have held as an endowment fund, the income from which to be used by the Council of our Association in making subsequent awards for the promotion of research work. It is my suggestion that the awards be made once in four or five years, when the income may have accumulated to a sufficient amount to assist a research worker to spend a considerable period of time in the field. I want the award to be made each time to one who has demonstrated ability to do original work in the field of geography and who has in hand a problem in physical geography which promises to produce important results.

"I think it would be appropriate for the Council to request those who receive these grants from the Association to present the results of their field work, conducted with the support of such a grant, at one of our national meetings and to offer to the Annals of the Association an opportunity to publish those results.

"I trust that the example which I have set will be followed by others, and that we may have, as an Association, funds available for the promotion of research work in the various fields of geography."

Four meritorious projects were submitted to the committee appointed by the Association to make the award. The one receiving the unanimous vote was by Dr. Richard Joel Russell, Louisiana State University, Baton Rouge, La. This project which deals with the deltas of the Mississippi received the award because of its great scientific interest and importance, its potential economic significance, and the eminent qualifications of Dr. Russell for carrying his project to a prompt and valuable conclusion.

Dr. Russell will use the award to help finance his field work and studies on the Volga River delta.

Dr. Howard H. Martin, Chairman of the Department of Geography, University of Washington, has been appointed a member of a staff of five leaders on the program of the Seattle Public Forums. These forums are sponsored by the Seattle Board of School Directors in coöperation with the United States Office of Education, and extend over a period of two months. Dr. Martin's lectures deal with different problems in the Orient.

The third annual meeting of the Association of Pacific Coast Geographers will be held in Denver, Colorado, June 23-25 in conjunction with the Centennial meeting of the A.A.A.S. Geographers who are not members of the A.P.C.G. but who are planning to attend the Denver meeting and would like to present papers are invited to communicate with the secretary, Dr. H. F. Raup, University of California at Los Angeles, or with the president, Dr. Howard H. Martin, University of Washington, Seattle. The Association's second yearbook is now available from the editor, Otis W. Freeman, State Normal School, Cheney, Washington.

A complete list of summer sessions abroad, "Holiday Courses in Europe, 1937," is available at the World Peace Foundation, 40 Mt. Vernon St., Boston. The cost is nominal. Additional information may be had from the Institute of International Education, 2 West 45th St., New York City.

Dr. Elmer Ekblaw of Clark University was the guest speaker at the March meeting of the Boston Association of Geography Teachers. A social hour and tea preceded the lecture which was held at the Twentieth Century Club. Mary T. O'Connell is the president of the Association.

University Extension News, Vol. 17, No. 18, Feb. 10, 1937, published by the University Extension Division of the University of Nebraska, is devoted to a program depicting the sequence of stages of economic development preceding Nebraska's admission to statehood and continuing to the present age. The program was given as a pageant by the Walnut Junior High School, Grand Island, Nebraska. Copies of the maps used in the pageant show boundaries and political units as they have evolved from preterritorial days to 1937. The news bulletin is suggestive of similar assembly programs that might be adapted to any state or region by geography sections in coöperation with other branches of the curriculum.

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THE POLISH CORRIDOR*

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Of all territorial settlements made at the end of the World War none has been so frequently criticized as that which we call the Polish Corridor. "There," said Marshal Foch, pointing his finger to the corridor on the map, "lies the root of the next war." Unquestionably the separation of East Prussia from the rest of Germany is an anomaly on the modern political map. There are, to be sure, other cases where important routes between parts of the same state pass thru the territory of another; it is true of both the United States and Canada, each with respect to the other. But only Germany and Panama are completely divided by land controlled by a foreign state.

Countless articles have been written to enlist our sympathies in Germany's claim to "more equitable boundaries." It is not the geographer's place to judge of rights and justice, but he is interested in analyzing the areal facts and relationships involved in the problem of the Corridor.[1] This indeed is an essential, tho incomplete, basis on which the individual may form his own judgement.

THE BACKGROUND OF THE PROBLEM

Much of the popular thought on this problem is misled from the start by assuming that this was a new problem created by the Peace Conference; that diplomats quite arbitrarily cut a corridor thru German territory and forced a German city to became a "Free State." But the confused distribution of German and Slavic settlements in these border regions has presented a problem since the beginning of modern history.[2] Of the several solutions attempted at various times none was so arbitrary and unreal as that of the nineteenth century—the complete elimination of Poland from the political map. "Unreal," because Poland, an area inhabited by tens of millions who persistently thought of themselves as the Polish nation, continued to exist. For a century and a half the "Polish question" was a very live ghost haunting the chancellories of Europe.

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* Based in part on study in the area, as a Fellow of the Social Science Research Council, 1931-2.

[1] Those interested in the scope and aims of political geography are referred to this writer's "Recent Developments in Political Geography," *American Political Science Review,* 1935, pp. 785-804, 943-966.

THE GEOGRAPHIC BACKGROUND

The geographic confusion of ethnographic, economic, and strategic relationships which constitute the "Corridor problem" has existed in one form or another since the Middle Ages. In general it is but one of several problems arising from the absence in the north European plain of any strong natural divides separating the settlements of German and Slavic peoples. Whatever line be taken as the cultural or linguistic divide between the two groups, there remain islands of population of one culture in the midst of the other, and mixed elements in nearly all districts, thruout a wide border zone. In the north this border zone must be considered as extending nearly two hundred miles, from a short distance west of the Vistula east as far as the Niemen. In this area during the past seven centuries, the several cultural groups have made different, conflicting adjustments to certain minor but important differences in the natural landscape. These have led to the present political differentiation of the Polish province of Pomorze (Pomerellia, West Prussia, or "the Corridor"), the Free State of Danzig, and the German province of East Prussia.

East and west of the Vistula delta the coastal lowlands are bordered on the south by the morainic hills of the Baltic Heights, forming a broken belt of sandy or marshy forested land, and hence constituting a minor natural divide separating the Poles of the more fertile interior plain from related Slavic groups on the north. Various harbors between Danzig and Memel permitted sea connections with German and Dutch ports of the Baltic and the North Sea. Cutting at right angles across these east-west features, is the valley of the Vistula, the shortest feasible connection between inland Poland and the sea.

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[2] The essential historical facts are so readily available in text books and atlases of European history that one might well be surprised that so many writers appear ignorant of them.

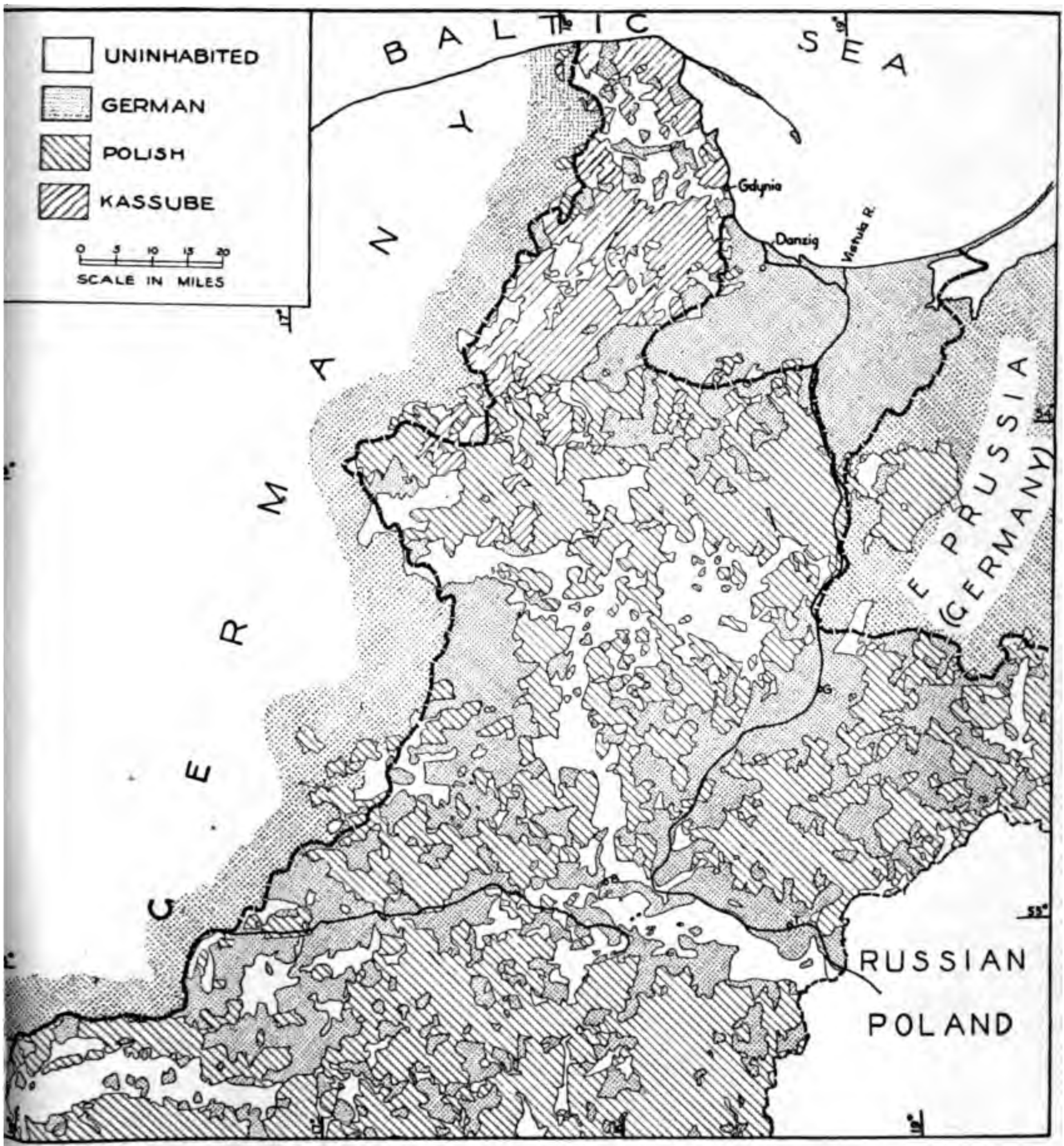

Fig. 1. Linguistic map of the Polish Corridor area, pre-war. Based on the language used by the majority the population of each community, as given in the Prussian Census of 1910. The white areas are largely ested. **The Netze and Vistula rivers are shown, and the cities: B—Bydgoszcz (Bromberg); T—Toruń horn); G—Grudziadz (Graudenz).** After Geisler.

West of the Vistula is a minor feature of special significance, the valley of the Netze River. This is a wide flat marshy valley south of the Baltic Heights, developed in interglacial periods as part of the east-west drainage system of the plain, connected with the valley of the Vistula at its great bend, just east of Bydgoszcz (Bromberg). In early historic times this may well have been an additional factor delaying expansion of Polish settlements to the north; in any case German settlers found it largely undeveloped by the Slavic peoples, who were not equipped to drain marshy land nor cultivate such heavy soils. It came to form a "German bridge" connecting the lower valleys of the Oder and the Vistula, and in more modern times has been used for an inland canal.

The Political Background

Both German and Slavic settlements were made in these various districts at different periods, in part regardless of which group was in political control. But to a larger extent, the national character of the populations was influenced by the culture of the ruling government. It is necessary, therefore, to summarize the political changes in the history of the area.

During the early Middle Ages this coastal area was but loosely organized by local Slavic rulers, at times under control of Polish kings. Beginning about 1300, the Teutonic Knights organized the region under German colonial rule, tho it was not considered a part of any German state. The defeat of the Knights by the King of Poland at the battle of Tannenberg, led to a division of the area in 1466, which lasted for three centuries. Pomerellia, together with Danzig and a part of East Prussia, were added to the kingdom of Poland. Danzig however retained many autonomous powers and was essentially a Free City under the Polish kings. The remainder of East Prussia was retained for some time by the Knights, but as a fief of the King of Poland. With the dissolution of the Order in 1618, it came into the hands of the Hohenzollerns of Brandenburg, and was incorporated, some fifty years later, with their state which took the name of the Kingdom of Prussia, but East Prussia was never a part of the old German Empire. This period ended only with the forceful partitioning of Poland, in 1772 and 1793, when the entire area, together with the neighboring Polish province of Poznan, was incorporated into the kingdom of Prussia, and after 1871, in the modern German Reich. This was the status which was destroyed by the treaty of Versailles, which again divided the rea into three parts. Pomerellia was included as the province of Pomorze, in the restored state of Poland; the Vistula delta, includng Danzig, was made a Free State, in economic union with Poland; nd East Prussia was left unchanged as part of Prussia and the German Reich.

The present division of the area is, therefore, in large part a estitution of the situation which prevailed during the longest eriod of Poland's history as a state. Further this division reflects he differences in the geographical connections of the different arts.

THE BACKGROUND OF SETTLEMENT

Danzig was always of special economic and strategic imporance.[3] Its location on the Vistula delta, commanded the river, and ater rail, traffic between interior Poland and the sea. It has, thereore, always been dependent upon, as well as essential to, the trade f Poland. But from the beginning of its development as a port y German traders from Lübeck in the thirteenth century, Danzig as never been Polish in population. That Danzig has always been German port serving the land of the Poles caused no serious ifficulties, as long as no political barriers were placed between he port and its hinterland.

While Danzig was dependent on its Polish hinterland, that nterior region, developed largely in terms of subsistence agriculure, had but minor interest in its sea outlet. As a Polish poet of the ixteenth century, Sebastian Klonowitz, puts it:

> A Pole may not know what the sea is
> If he ploughs diligently. . . .

However, the landed estates of the nobility, at least along the Visula waterway, produced surpluses of grain which could only be xported thru Danzig. In 1492 this amounted to nearly a million ushels. Furthermore, the rulers of Poland had strategic reasons or desiring a sea connection. These interests were, therefore, comlementary to the economic interests of the German merchants and hippers in Danzig. Consequently, when the Teutonic Knights in he fifteenth century imposed restrictions on the trade of Danzig hat city combined with the Polish king to overthrow the power of the Order, and placed themselves under Polish rule. But as a German and later protestant city, a member of the powerful Hanseatic League, Danzig always occupied a special and privileged position in Poland, similar to that of the Free Cities in Germany at that time.

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[3] The historical facts concerning Danzig were taken from a number of German urces, as agreed to also by Polish writers. The principal source is P. Simson, "Danzigs eschichte," in Monographien Deutscher Städte, Danzig (Oldenburg, 1914), pp. 10-21, n abstract of his study of several volumes, Die Geschichte der Stadt Danzig.

The rural area of Pomerellia (West Prussia) was of course essential to Poland to maintain unhindered connection with Danzig. As it had no other harbor to provide connections with Germany, there were but few German settlements, excepting perhaps in the valley of the Netze River on the south.

In East Prussia there were several smaller German ports, of no importance to the Polish areas from which it was separated by the sand hills and Masurian lakes. Remaining essentially a German colony, connected by sea routes, it ultimately became predominantly German in population.

THE GERMAN SOLUTION IN THE PRE-WAR PERIOD

Before the railroad era the trade of East Prussia was carried on largely by sea, so that its land separation from Germany was of little economic importance. On the other hand it presented a serious military problem after it was incorporated with Brandenburg, especially after Russia began expanding along the Baltic. For this reason Frederick the Great made it one of the main purposes of himself and his successors to bridge the gap by eating up Polish Prussia, "piece by piece," with Danzig reserved for "the last bite."[4] Thanks to the assistance of Russia and Austria he was able to accomplish this more rapidly than he had expected, by the first two partitions of Poland. But Poland was thereby cut off from its one important sea connection, and the Poles note that two years later the third partition completely dismembered their state. Poles will not forget that to lose the Vistual was to lose the state, as Frederick the Great foretold: "Whoever shall possess the course of the Vistula and the city of Danzig will be the master of this state (Poland) more than the king who governs it."[5]

For the following century and a half, then, this problem was "solved" in a sense apparently satisfactory from the German point of view. Actually, the inclusion of these Polish territories in Prussia constituted an indigestible element in the state, especially as naionalism developed. This situation even forced Bismarck to aid ussia in suppressing Polish insurrection in the Middle Vistula rea.[6]

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[4] "Testament politique (1752)," in Die Politischen Testamente Friedrich's des Grossen, G. B. Volz, ed., (Berlin, 1920), p. 64.

[5] "Testament politique (1768)," ibid., p. 213.

THE PROBLEM SINCE THE WAR

The conflicting elements in this problem in past history remain ssentially the same today: the German need of continuous land onnection with East Prussia, and Poland's need for a connection ith the sea. But under modern conditions both needs are greater an before. The development of railroads, not to mention aero-lanes, has increased the importance of the land connection with ast Prussia, which has become an integral province rather than a ere maritime colony of Germany. Likewise modern Poland has ar more commerce with the sea, and its need of a strategic connec-ion by sea routes with other allies is even greater than before.

In addition a third major element has been introduced by the evelopment, within the past century, of a strong sense of nation-lity, based on cultural differences. This element presumably elimi-ates any possibility of solving the problem according to some olish suggestions, by the simple method of including the entire rea concerned in Poland. It introduces also conflicting interests f the population within Pomerellia and presents Danzig with the ell-nigh insoluble conflict of strong national affiliations with Ger-any but economic dependence, as of old, on Poland. An outgrowth f this conflict in Danzig is the new Polish port of Gdynia, as a esult of which the ancient port is now in the unhappy position of eing economically dependent on a foreign state which is no longer ependent upon her. Each of these three major elements must be xamined in their relation to the present aspects of the problem.

THE CONFUSION OF NATIONALITIES

At the time of the most recent division of this area, following he World War, the concept of nationalities had become one of the ajor principles in territorial settlements. That Danzig was com-letely German and East Prussia predominantly so, is generally nown. It is not so generally realized, however, that in Pomerellia, he corridor area, the populations were very mixed. The popular oncept of a "corridor" cut thru definitely German area simply to arry Poland to the sea is based on ignorance of the facts attested by the pre-war German census, as well as the elections to the Prussian and German legislatures over many years.

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[6] This thought is clearly indicated in his speeches before the lower house of the russian legislature, on the 18th and 26th of February, 1863. Bismarck: "Parlamentarische eden," W. Böhm, ed., Vol. 2, pp. 60, 69.

For the actual situation at the time of the Peace Conference it is necessary to depend chiefly on the last previous Prussian Census, that of 1910.[7] This situation is shown in detail on the accompanying map (Fig. 1). We can simplify this by dividing the area of the corridor into three districts, from north to south. The morainic sandy, forested hills of the north are sparsely populated by Slavic wood-cutters and part-time farmers and fishermen. These constituted not quite two-thirds of the population; the remainder were Germans, chiefly town dwellers. As the Kassube dialect spoken by this Slavic group is somewhat different from Polish, German writers insist that this group should not be included in the Polish nationality. But this emphasis on differences in dialect, no greater than those found within Germay, is too academic. The political importance of language is based on the possibility of common understanding, and the Kassubes are mutually understood by Poles and not by Germans. It is no doubt true that at the time this area was taken from Poland in 1772, the Kassubes were not conscious of national affiliation with the Poles; neither were the Germans of Danzig with those of Berlin. But even German students make it clear that a feeling of Polish nationality had in fact developed in the past two generations, due not only to Polish agitators but also to anti-Slavic measures of the Prussian government.[8]

In the middle district, likewise sparsely populated, Poles together with probably a smaller number of Kassubes, form a slightly smaller majority, 59 per cent of the total.

In the south, on the other hand, was an almost continuous belt of predominantly German territory extending east along the Netze Valley to its junction with the Vistula, thence up that river as far as the pre-war boundary, at Thorn (now Torun) and down it to its delta at Danzig. This belt, therefore, formed a "German bridge" across the Corridor. The greater number of the Germans were concentrated in the three cities, each of approximately fifty thousand population; in these the proportions of Germans ranged from

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[7] On the whole, neutral students are inclined to accept these returns. No one, in 1910, could suppose that the statistics would be used nine years later to determine the allocation of the territory—a thought which since the war is never absent from the minds of those taking a census of nationalities or languages in nearly all countries of central Europe. It is possible, however, that many who were counted as Poles should more properly have been counted as Kassubes.

[8] Hans Harmsen, "Die Kaschubie," in Volk und Reich, 7, pp. 448-456, (1931).

66 to 85 per cent. Some of these settlements dated from the first period of German rule, under the Teutonic Knights, some from the subsequent Polish period. But the greater part of the German settlement occurred during the later period of Prussian rule, many being but recent immigrants not permanently settled in the area. These included the following classes: the government officials and military garrisons, all but the lowest rank of workers in government controlled services such as schools and railroads, and the great majority of the professional classes and business men. This was, in part, a natural result of the higher development of both education and commerce in German cities and of the advantages of business connections with German wholesale houses, but it was also encouraged by official and semi-official discriminations against the national minority. For similar reasons, descendants of Polish stock had become Germanized.

It would be futile, as well as purely academic, to attempt to estimate how many in this province were Polish or German "by blood." For the distinction between the two groups is in no sense a biological one, but purely a cultural one. Thruout the centuries in which the members of both groups have lived together, there has inevitably been much mixture of blood and of family names. This was particularly true before the Reformation introduced social separation of Protestant Germans from Catholic Poles.

It is also true that the linguistic division does not necessarily represent the national division. The experience in the other plebiscites in this border land suggests that many Polish speaking persons might have sincerely voted for Germany. But this comparison is not a fair one because of important differences in the situation in the other areas. The continuous support, by Kassubes as well as Poles, of Polish representatives in the Prussian and German legislatures is some evidence, tho not decisive, of the national character of the Polish-speaking population in this area.

If we take the census figures as they stand—and as indeed they were assumed by German leaders before and during the War—it is clear that the northern two districts were predominantly Polish, the southern predominantly German. We need not take time to demonstrate that a division of the territory on this basis would have been absurd. Taking the area as a whole, we find that there was a slight German majority, actually 51 per cent. If military and government officials were excluded, it is possible that this would have reduced the number to slightly less than a majority; if the count were limited to native-born, or even to those of long standing residence—as was done in Upper Silesia—it is almost certain that the Poles and Kassubes together would have formed a distinct majority. But fortunately it is beyond our task to say what method of counting would have been "just."

If instead of considering merely the portion of the Corridor area which was actually transferred from Germany to Poland, we include also that of the Free State of Danzig we find a German majority of not quite 60 per cent. It is clear from the previous discussion that there are sound reasons both for and against this basis of reckoning.

If our map represents the nationality situation at the time of the settlement in 1919, it is important to ask what is the situation today. Large numbers of those directly concerned at that time could not profit from any change that might now be made. A considerable proportion have died; others have moved away.

In Danzig, left to the control of its own German population, there has been little change. In the Corridor, however, the change has been extraordinary, indeed one of the most sudden changes in population in modern times. The great majority of the former German inhabitants have left the area; in their place have come large numbers of Poles from the former Russian and Austrian parts of Poland, so that Poles (including Kassubes) now constitute over 80 per cent of the total population. This change has been greatest in the cities, none of which have now as much as 15 per cent German population. In other words, two-thirds or more of the total population of three cities have left their homes and places of business and as many new people moved in, so that cities formerly overwhelmingly German in character are now equally strongly Polish.[9]

While many factors are known to have contributed to this extraordinary exodus it is impossible to measure their relative importance. Immediately after, if not before, the granting of the territory to Poland, the German officialdom and military naturally left. Likewise, there was soon no reason for German employees of public services to remain, and German professional peoples found their former political advantages turned into disadvantages. The same was true of business men who had to change their connections from Frankfurt and Berlin to Poznan and Warsaw. But in addition the Poles used both legal and extra-legal methods to make things

[9] Based on the Polish Censuses of 1921 and 1926, accepted by German writers. Hermann Rauschning, Die Entdeutschung Posens und Westpreussens. 10 Jahre Polnishcher Politik. Berlin, 1930. Describes the persecution of the German minority.

intolerable for the Germans. Within two years the cities had lost three-fourths of their German population, the rural areas a third, and there was no "Kreis" (small county) in the area with a German majority. A few years later, in 1925, many more chose to leave rather than to accept citizenship in Poland, so that by 1926 the cities had lost 85 per cent of their original German population, the rural parts over half, and the highest proportion of Germans in any Kreis was only one-third its total. Even with the addition of Danzig to the corridor the area as a whole could no longer show a German majority.

THE PROBLEM OF EAST PRUSSIA

The Corridor is of concern to three German areas: to East Prussia, to Germany as a whole, and to Danzig. East Prussia has been made into a political and economic island, as it was in the earlier period. But the separation from the rest of Germany, with which it had become more intimately related by trade, is not nearly so serious as it is commonly painted. The seacoast connections remain unaffected by the Corridor. The land connections were pronounced completely adequate in 1923 by an official of the German railroads;[10] in ten years only eight cases concerning rail transportation were brought before the "Corridor Court of Arbitration."[11] Judging from the writer's personal experience as well as from German reports, it is clear that passengers and freight crossing this supposed barrier suffer but little more inconvenience than do those that go from Detroit to Buffalo thru Canada. In the years when President von Hindenburg spent his summers on his East Prussian estate no German newspaper found anything surprising in the frequent trips which he and his advisers were constantly making back and forth across this part of Poland.

That East Prussian agriculture has been nearly bankrupt since the war is not due to the minor difficulties incurred in shipping across the Corridor, nor even to the loss of the Danzig market. German economists have recognized that the large land estates of the Junkers, organized for grain and sugar-beet production, cannot compete successfully with overseas production. This system has been maintained only by repeated assistance from the central government in Berlin, largely for political reasons.

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[10] Holz: Ost-preussens Wirtschaft und Verkehr vor und nach dem Kriege. Königsberg, 1923, p. 9; reference from C. Smogorzewski, Poland, Germany and the Corridor. London 1930, pp. 46-48.

[11] Carl Budding, Der Polnishche Korridor als Europäisches Problem. Ostland-Darstellungen 2, Danzig, 1932, p. 22.

RELATION TO GERMANY AS A WHOLE

Germany's interest in East Prussia and the Corridor is almost entirely political, as neither area is of great economic value. One consideration is a fear that East Prussia might gravitate toward Poland. Various German leaders in the province as early as 1919, suggested the economic desirability of a customs union (but not political union) with Poland, as almost dictated from the geographical situation. Indeed some Polish writers have said that Poland need only have patience till East Prussia "will fall like a ripe apple" into their laps. Hence the need of constantly bolstering up the strength and loyalty of German landlords with financial assistance from Berlin. The Mazures, who form most of the peasantry in the southern part of East Prussia, speak a Polish dialect, and tho they voted for Germany in the post-war plebiscites, the Germans fear that the work of Polish agitators may undermine their loyalty.

But of course the main consideration is based on the assumption of war-time conditions. If Germany were at war with some state to the east, tho Poland remained neutral and, therefore, obligated to permit German troops to move by rail across the Corridor, train movements are controlled by the Poles, who might conceivably cause difficulties and critical delays. In case Germany and Poland were at war with each other, it is obvious that the situation would be impossible to maintain; unless the army from Germany were able to take the Corridor, East Prussia might be overrun by Polish troops.

While this possibility is constantly in the minds of the Germans, much of their feeling on the subject is less rational. The mere fact that every German, from school age on, is constantly presented with a visual picture of his country torn in two by foreign territory is of great importance. Most of the population of Germany, concentrated in western and central Germany actually know little more about the areas concerned than do most Americans about the Mexican problem in our Southwest. But every map of their country reminds them of this situation in a way that makes it seem intolerable. For this reason the agreement made between the two countries in 1933, to discontinue hostile propaganda against each other, may be of great value.

THE PROBLEM OF DANZIG

From the German point of view it is of course absurd that so completely German an area as that of Danzig should not merely be separated from the Reich, but tied economically, and in its foreign relations, with a foreign state. The citizens of Danzig feel the same way, so far as their national interest is concerned. But unfortunately for them their economic interest is in the opposite direction. As an mportant seaport, wholesale and manufacturing center, Danzig can live only on its connections with Poland. If it were joined to Germany, without the Corridor, its tributary region would be reduced to a small part of East Prussia, whose own ports complain of ack of trade. Even with the Corridor, the tributary area of Danzig ncludes but little over a million population with no industrial centers, whereas today it handles nearly half the sea trade of all Poland, a land of some thirty million people, including important ndustrial centers at Lodz, Warsaw, and especially Upper Silesia.

Hence Danzig could hardly accept reunion with the Reich unless Poland were ready to assure it of continued share in its sea trade. In view of the natural desire of the Poles to increase the business of their own port at Gdynia, this is hardly conceivable, unless Germany be in the position to dictate to Poland. That this is still far from the case is shown by the fact that, even after the recent treaty which some assume made the two countries allies, Danzig accepted an agreement with Poland which, in exchange for various minority rights to Poles in the Free State, secured its port only 45 per cent of Poland's sea trade, Gdynia getting the larger share.

The history of Danzig in the last seventeen years presents one of the best examples of the struggle between nationalist emotion and economic interest. Its new economic relation with Poland, in spite of having brought greater traffic to the port than ever before, has apparently not diminished its national ardor for Germany in the slightest. To be sure, in every struggle with Poland, the Free State has ultimately made the necessary concessions and spoken in terms of the necessary cooperation with that state for their mutual benefit, but only after its national emotions had expressed themselves in opposition, to the ultimate advantage of Gdynia.

WHAT THE CORRIDOR MEANS TO POLAND

The Poles seriously object to the term "corridor" for they claim hat the province of Pomorze ("the land by the sea"), has always been essentially Polish and now, almost completely so, is incorporated as an integral part of the Polish state. Nevertheless, it remains a minor part, and their major interest in it is still as their only outlet to the sea.

For economic purposes in peace times it is not necessary that a country's sea outlet should be under its political control. If the Poles can operate trains for Germany across the Corridor, Germans could just as well do the same for Poland to the sea, and German merchants and shippers would be delighted to handle the trade at the ports. Such arrangements have long been satisfactory in the overseas trade of Switzerland, and much of that of Canada, which goes thru American ports, to say nothing of the American grain trade thru Montreal. Since the war, Austria and Czechoslovakia have made similar arrangements, the latter having been granted a special part of the port of Hamburg for its trade. Under normal business conditions there is never any fear that German railroads and German shippers at Hamburg will decline to handle Czechoslovakian goods; on the contrary if that country should suddenly shift its trade thru, say, Trieste or Gdynia, the German ambassador at Prague would undoubtedly be instructed to file a complaint.

The political significance of "an outlet to the sea" is due almost entirely to its strategic importance in time of danger. Poland, located between two much larger states from both of whom it has acquired territories claimed by them, in case of war with either one, will be at the mercy of the other unless it can get help from the outside. That help—say from France or England—would probably have to come by sea. In contrast with Czechoslovakia, which has several possible sea connections, Poland has only one feasible route. Consequently, if the Corridor were in Germany's hands we would have again the situation which Frederick the Great so frankly described. If, then, Poland were involved in a conflict with Russia, Germany, before permitting essential munitions or troops to enter from the sea, could exact the return of its other "lost provinces" and again destroy the independence of Poland. Or by preventing the passage altogether it might, without going to war itself, help to bring on the defeat of Poland and then step in to take its share of the remains.

A situation of this kind actually arose during the war between Poland and the Soviet Union in 1921. As the Red Army was advancing on Warsaw the dock-workers in Danzig refused to unload munitions destined for the Polish army.

Realizing from this experience that Danzig, even when sepaated from Germany, was not a safe port in time of crisis, the Poles nmediately laid plans for a new port on the coast of Pomorze. An rtificial harbor was constructed and piers built; where formerly a ew fishermen dried their nets the modern port of Gdynia has de-eloped. Planned originally for strategic purposes it has become he major threat to the economic life of Danzig. Governmental influ-nce is strong enough to control the routing of trade in Poland more r less as it wishes; national pride, perhaps, has determined that dynia should have the larger share. In return for its smaller share anzig has been forced to grant the Poles unusual minority rights. unique feature is the extension of the Polish postal system in the ree State, paralleling that of Danzig itself.

ALTERNATIVE OUTLETS FOR POLAND

Since it appears impossible to satisfy the conflicting interests in he corridor area, alternative solutions have been sought elsewhere. ne suggestion involves the port of Memel, itself a root of con-roversy between Germany and Lithuania. In exchange for the eturn of both Pomorze and Danzig, Poland would receive Memel nd a corridor to it, to be cut from the eastern border of East russia, so that no state would be divided. But how is Lithuania to e compensated for the loss of its only port? In any case, this is a ubstitute unacceptable to Poland. It would have to sacrifice a rovince which it regards as an integral part of the state, to say othing of the vast sums invested in Gdynia and the new railroad uilt to it from Upper Silesia. Nor can one ignore the national ride which Poles have cultivated in developing their own port; nnual celebrations are held at Gdynia, attended by delegates from he peasantry of all parts of the country. More fundamental, how-ver, is the fact that the major commercial and industrial centers, Varsaw, Lodz, Poznan, Upper Silesia, and Krakow, are all in the estern half of Poland. The distances from them to Memel are rom 50 to 100 per cent greater than to Gdynia or Danzig. From a trategic point of view the outlet suggested would be no safer, since t could easily be cut by Russia, even conceivably by Lithuania.

Even less feasible is another alternative much discussed in the ast few years as a presumed object of the Polish-German agree-nent. This would consist of a corridor thru the Ukraine to Odessa n the Black Sea. We need not consider here the difficulty of captur-ng an area so close to the all-important industrial district of the onetz coalfield, the industrial heart of the Soviet Union. Of what use to Poland would be a port which is two to five times as far from its critical centers as are the Corridor ports? For its principal sea-trade, with the Baltic and North Sea countries, the Black Sea route would be economically impossible. In case of war it would provide a very remote connection with any western allies, one which Russia could break by land or sea.

Summary

The term, "Polish Corridor," expresses the post-war aspect of a problem which is centuries old. Geographical connections in opposite directions with Poland and Germany, varying in different parts of the area, led to a confusion of settlements and of political interests. No solution in the past has been satisfactory to both sides. Whatever the territorial settlement, the economic problems involved are not insurmountable, whereas the strategic problem appears to be insoluble. The present settlement more nearly satisfies the national interests of the populations in the areas than any in the past, probably more than any other that could be made. But it presents Danzig with the unavoidable choice between national and economic interests. To Germany it represents a threat against the security of a province of two million population; but far more important is the psychological attitude resulting from the fact that Germany alone of major states is cut by the territory of another state. To Poland the Corridor represents an area which is now thoroly Polish, an integral part of its state, and in which it has built its own modern port; but more important, this area alone can provide the vital connection with the sea. If twenty or more million Poles are to remain independent of Germany and Russia they cannot give up this area. Since the only change they can suggest, that East Prussia join Poland, would hardly be acceptable to Germany, we must conclude that there is no geographical solution, i.e., by change of territory. A situation satisfactory to both sides can only be achieved, if at all, by changes of other kinds, in regard to tariff walls, treatment of minorities, and particularly, psychological attitudes.[12] For this reason the present armistice on propaganda holds some promise for a better future.

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[12] A number of valuable suggestions are given by Dr. J. A. van Hamel, a former High Commissioner of the League of Nations in the Free City of Danzig, 1925-1929, in "Danzig and the Polish Problem," Association for International Conciliation, Documents for 1933, (No. 288), pp. 156-169.

THE POWER OF JAPAN AND CHINA: A STUDY IN POLITICAL GEOGRAPHY

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As Europe stands balanced between peace and war, warnings are being heard repeatedly of an approaching conflict in the Orient also, quite as vital to almost twice as many people. Some writers predict that this struggle in the East, between China and Japan, will be a military one—soon, short, and decisive—in favor of Japan. Others think that the struggle will be long and the outcome doubtful. Many current opinions as to the power of either nation lack soundness in the fact that they consider only the actual and visible achievements of the people, and ignore or minimize fundamental economic-geographic conditions. If, however, geography plays time-keeper for a race between what seem to be the hare and the tortoise of the Orient, which may we expect to be the victor there, and what will its victory be worth to it among the greater powers of the world?

In the eighty or so years since the Western world pierced Eastern isolation, the entire social and economic structure of Japan has been profoundly shaken; and the coastal areas of its larger neighbor have likewise been materially affected. This invasion of Westernism has brought with it the desire of one, if not both, of the nations to emulate the great powers of the world. In pursuit of such ambitions recent events have shown Japan in the rôle of parasite determinedly laying hold on the land and feeding upon the resources of a great phlegmatic China. Whether it will, in the end, devour its elephantine prey or digest it with any degree of ease is still conjectural. It may be possible, however, to predict the outcome thru an examination of some of the factors which serve as fundamental bases for the rise of any nation to permanent world power.

SUPPORTING THE PEOPLE

At present, the most acute problem for both Japan and China is the necessity of caring for already dense populations which are increasing with startling rapidity, one million annually in Japan and over one half million in China. China has an area of 2,600,000 square miles and a population of about 457 million, as contrasted with Japan's area of 260,000 square miles and 83.5 million people.[1] China is, therefore, approximately ten times the size of Japan and has five and one-half times as many people. China's 175 people per square mile and Japan's 320 would indicate that China is much less densely populated. But, in reality, only the seventeen eastern provinces make up what may be considered to be China, for the western half of the country's territory is so non-productive, sparsely settled, and isolated that it has little or no importance in the nation. If only this eastern area is considered, then China is four and one-half times as large as Japan, has five times as many people, and the density of population slightly exceeds that of Japan. Densities in the two nations compare favorably with those in other countries, such as Italy and Germany, which have 356 and 364 respectively. However, the severe pressure of people on the supporting capacity of the land is shown by the fact that China must feed 1,813 people per cultivated square mile; and Japan, 2,072. In contrast, France has 827 persons per cultivated square mile and Germany approximately 850. This excess of population will likely increase with the coming of Western ideas of lower death rates, unless birth control can be exercised also, and several factors, such as religion, insurance of support in old age, early marriages, and concubinage point to a continued increase in the birth rate. Altho China seems slightly better off than Japan both in density and rate of increase (floods, famines, droughts, and disease are contributing factors), both countries have a population burden to overcome which cannot be ignored if they are to compete effectively with other great powers.

With such an enormous population pressure Japan and China are both searching for possible ways to increase the supporting capacity of the land. The heavy population of the past has already caused almost all available land to be put into use. This is shown in Japan partly by the fact that in 1909 the percentage of cultivated land to uncultivated was 14.6; with the next decade it had increased only 1 per cent; and in the 1920's the increase was virtually at a standstill. On Japan's island of Hokkaido there is perhaps room for two million more people, but the more severe climatic environment nds to discourage settlement there. Colonization on a large scale the much advertized Manchukuo is seen to be an improbable, d under present financial conditions an impossible, task.

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[1] Thruout this study, China is limited to China Proper (excluding Farther Tibet and Outer Mongolia); and Japan includes only Japan Proper, Chosen, and Taiwan. The debatable territories of both Jehol and Manchukuo have been omitted from both countries.

Discrepancies in figures may be due to the necessity for using many different sources, both official and unofficial. Caution is necessary in the use of any figures for Oriental countries, especially for China where many statistics are only estimates.

In China, also, the utilization of available land for cultivation s been pushed to the limit. Improved methods of cultivation, od control, dry farming, and the value to be found in new foods, ch as potatoes, corn, and fruit and nut trees, may relieve China's rm problems slightly; but such relief seems small when it is served that the farms average not more than two to five acres present. The average is 30 in France and 160 in the United tates.

Food production in eastern China and in Japan is not greatly stricted by climate, for the diversity and range of temperatures d rainfall in the former and the modified continental climate of e latter make it possible to produce a range of crops from sub- opical, such as rice and sugar, to north temperate, such as wheat, ans, and oats. The chief difficulty, then, is one of available land, r the topography of the two countries greatly limits areas where rofitable crop production may be carried on. Thus each lacks a margin of livelihood,'' and the heavy importation of foodstuffs an indication of the impossibility of any reserve supply of foods case of conflict.

THE TURN TO INDUSTRY

Impelled by the ever-increasing population and led on by a ream of world power, Japan entered upon an era of industrializa- on about 1859. It was shortly after this date, when 6,000 spindles ere introduced into the country, that Japan seems to have first nceived the idea of becoming the "Britain of the East." Observ- g that Britain, also a small island empire, chiefly thru manufac- ring as a basic industry, had attained first rank in the world, e ambitious Japanese apparently saw no reason why they too uld not use the same means to accomplish as much. Thus in the st sixty years the greatest single aim of Japan has been a frenzy realize power thru industrialization. The 85 per cent of the opulation engaged in agriculture and domestic handicraft in the ighteenth century has dropped to 51 per cent, and the 16 per cent ving in towns of over 10,000 in 1894 had reached 32 per cent in 920. During this period the number of factory workers increased t the rate of approximately 47,000 each year.

In striking contrast to Japan, China's growth in city workers has been neither so rapid nor so great. In cities such as Shanghai, Hankow, Tientsin, and Tsingtao it is just now emerging from its lethargy of domestic handicraft into modern industrial development. The percentage of farmers in China is decreasing but slowly, and few of the masses have thus far been affected by the coming of manufactures. It is quite probable, however, that here, as in Japan, future industrialization and its attendant occupations will do much to help care for China's population problems.

THE DEVELOPMENT OF MANUFACTURING

The leading manufactures of both countries are in the field of textiles, but the cotton spindles of Japan are more than double those of China, a country with five times as many people. While the number of spindles in the United Kingdom, the United States, and Germany far exceed those in Japan, it is significant to note that they all have less than they did twenty years ago and that Japan has four times as many as it did in 1916. Japan now employs 998,631 workers in its textile mills. Such impressive figures, nevertheless, are but a small measure of Japan's actual position as far as its ambition to become a world industrial power is concerned, as is shown by these considerations:

First, Japan is still far outranked by some of the other great nations, such as Germany, whose population is similar but whose factories exceed Japan's by 1,836,100 and employ almost five times as many workers. Despite the fact that Japan has boomed and advertized its industries, it remains chiefly an agricultural nation. Witness the 10 percent of the population employed in manufacturing in Japan as opposed to the 40 per cent in the United Kingdom. In Italy, where 47 per cent in agriculture approaches the percentage of farmers in Japan, the percentage employed in manufacturing is almost three times as great. Too, the personnel of Japanese factory workers differs from that of the great powers. Where Japan has slightly more women than men in all factories (indicating light types of fabrication with a fluctuating payroll), the United Kingdom has almost three times as many men as women, and the United States six times.

Second, those who emphasize the rapid accomplishments of Japan in industry often fail to take cognizance of the fact that the government has borrowed heavily in order to encourage manufacturing thru aid, and that as a result a very few capitalists are growing wealthy at the expense of a paternalistic government while the development of business initiative among the masses moves ahead only slowly. Basic industries, such as iron works and railroads, are often subsidized by government funds and textile factories have developed with the use of machinery from abroad.

Third, the greatest single weakness of any dream of Japan to become a second Britain lies in the paucity of the basic resources. It is in this last consideration that the dormant possibilities of China dwarf those of Japan.

If the Japanese Empire rises to permanent world power thru the development of its industries, it will present a most remarkable anomaly to other great nations, for it possesses an alarming nadequacy of raw materials, and is poor in iron to construct and he power to drive machinery.

The most important single fabricated product is cotton goods, yet Japan must import almost the entire supply of raw cotton from China, India, Egypt, and the United States. Japan can produce cotton but the pressure of population makes it necessary to give he land over to food production instead. Japan has thus far been China's chief fabricator, serving as its best customer for raw coton and yarn, and supplying it in return with cotton goods. Since he introduction of large scale manufacturing into China, however, Japan's lucrative trade there may be reduced.

The growth of iron and steel manufactures from 69 thousand ons in 1913 to almost 7.5 million tons in 1935 (production more than doubled between 1933 and 1935) would seem to show Japan to be a coming Britain. But, unlike Britain (and this very difference s one of the most potent obstacles to its rise), Japan has little coal, the coal it has is of poor coking quality, and its iron ore is nferior. Perhaps, in no other industry has Japan so brilliantly succeeded in deceiving the world as in its power to produce iron and steel. Other nations may feel alarm when they learn that Japan supplies itself with 80 per cent of its steel demand; but this alarm s lessened somewhat when they learn that it produces only 63 per cent of its pig iron; and it subsides altogether with the knowledge that it can furnish but 9 per cent of its iron ore demand. Thus Japan, in order to produce pig iron and steel, is importing 91 per cent of the raw materials either in the form of ore or scrap and wrought iron. In 1934 its imports ranking third, fifth, and seventh in value were wrought iron, mineral oil, and coal respectively. The possibility of hydroelectric power, in a country of good rainfall and rugged land, is apparent. But of the potential 8,600,000 horsepower it has already developed 4,200,000 horsepower, so that development to the limit will still be insufficient.

Sarp has estimated the oil reserves of Japan at 1,235 million barrels, a quantity that would last the United States just 1.5 years at its present rate of production. Of Japan's present consumption of 280 million gallons annually it supplies only 23 per cent itself. Only one mineral, copper, does it produce in larger quantities than it needs, and in the extraction of this it usually ranks fourth in the world. The paucity of mineral resources in general is indicated by the small number of miners employed—in 1932, 185,840 as against 442,583 in Germany, and 809,475 in the United States.

The present inferiority of China's position to that of Japan is evident, and it is with just trepidations that it eyes its tiny rival. While China has only one-half as many cotton spindles and one-third as many textile workers as Japan, the number has increased almost five times in the last thirty years. At the same time, its increasing domestic industry in competition with Japan is illustrated by the decrease in the value of cotton piece goods entering China since 1931, from $36,507,000 in that year to $24,652,000 in 1932, $10,605,000 in 1933, and only $4,890,000 in 1934. The extent of Japan's investment in Chinese industries, however, is seen in the ownership by Japanese of 41 of the 133 cotton mills of 1933.

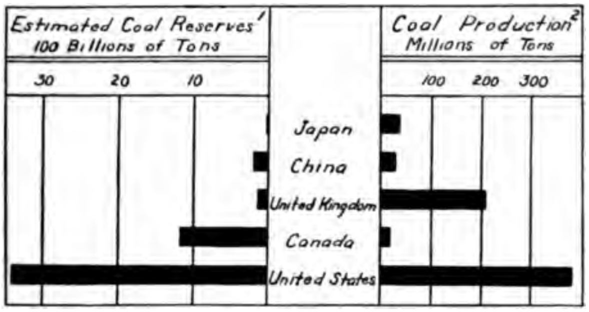

FIG. 1. Coal reserves and production for five selected countries. Orchard estimates China's reserves at 2,211 tons per capita, those of the United States at 27,000, the United Kingdom, 4,070, and Germany, 3,921. (John E. Orchard, *Japan's Economic Position*, 281)

It is in the raw materials with which to continue production that China far outstrips its rival. It produces 2,000 times as much cotton as Japan, ranking next to the United States and India, while Japan is surpassed only by the United States and the United Kingdom in the amount of raw cotton consumed. China ranks fourth in the world in reserves (actual and probable) of coal, despite the fact that it has, thus far, taken little advantage of these fields. With more coal than the United Kingdom in reserve it produces less than Japan; and the United States produces, in one year, more coal than the Japanese Empire has within its borders. At present most of China's coal *mines* are in Manchukuo and Jehol, now effectively alienated, but the major part of the *reserves* still lie within its own provinces. Greater production in the latter area will be encouraged by future industrial development, but must await capil, stability of government, and better transportation facilities. An dication of the growing uses for coal is seen in the fact that in 33 it mined more coal than in 1932, yet exported just one-fourth s much. In the same year it imported three times as much coal as as exported.

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[1] Statesman's Yearbook, 1935; Foreign Commerce Yearbook, 1935. Figures for 1933 or 1934.

[2] H. M. Hoar. The Coal Industry of the World, United States Department of Commerce Trade Promotion Series, No. 105. Actual and probable coal, including brown coal.

In the location of its iron deposits of one billion tons China is ot so fortunate, for almost three-fourths are found in Manchukuo. ere again the influence of Japan is shown by the fact that it conols, financially at least, 90 per cent of China's iron ore deposits. f the 250 million tons remaining in the eastern provinces, producon in 1933 was only 2.5 million tons (over 13 million in the United tates, 6 in Britain, and almost 2 in Japan), and one-third of this as exported to Japan as ore.

China annually produces about 60 per cent of the world's antiony and one-half of its tungsten. Tin is an important export and ad, manganese, and zinc are known to exist in quantities suffiient for profitable extraction some day. In minerals China has a ood supply for use in its own industries for years to come; whether he resources are sufficient to place it on a par, for example, with he United States is extremely doubtful.

Japan has already attained a place far in advance of its neighor's. The formidableness of its position, however, diminishes when ts deficiencies in raw materials and minerals are realized. Japan roudly blows the blasts from its industrial whistles, but so long s the present limits of the Empire remain it may strive in vain o achieve permanent front rank in industry and in world power. nd what of China? Tho it has been slow to waken, if it is allowed o rise unhindered does geography so clearly mark its limit as it oes Japan's? The possibilities for future industrial development, ven if only to serve a vast home market of 400 million cannot be enied, and China has ample coal to fabricate its own supplies of inerals and agricultural products; but if it hopes to industrialize s Britain, Germany, and the United States have industrialized, it ill find that its coal and iron are of lamentably inferior grade. It ill, no doubt, develop manufacturing greatly at some places in the ext few decades, but the scarcity of such things as copper, peroleum, and timber will always prove to be limitations. It is imortant to note that with the alternative of industrialization to help are for the population burden, its former self-sufficiency is breakng down. And across the Yellow Sea, Japan's lack of national sustenance, in a manufacturing regime, increases with the construction of each factory.

Trading Abroad

The character and amount of foreign trade for both Japan and China reveal weaknesses also which must become obstacles to paramount world positions. Here again Japan's accomplished development is greater than China's, for its foreign trade in 1933 was $2,200,000,000 and that of China was only $1,600,000,000. Between 1929 and 1934 six of Japan's most important exports showed an average gain of 383 per cent and the total exports since 1931 have doubled. An even greater difference is shown in the per capita foreign trade: in 1934 China imported $.47 per capita and exported $.24 and Japan imported $5.93 per capita and exported $5.56. But per capita import and export trade does not necessarily insure world power, for Canada's is $28.60 and $36.70 and Switzerland's is $65.80 and $38.30; and these two are and will remain less than first rate nations. A world economic boycott against Japan could prove to be a most effective weapon, as was shown by the effect of China's boycott after the 1931 invasion of Manchuria (Fig. 2). Since China is one of the greatest customers of Japan's factories the need for China's good will is evident. With each Nippon advance into China's territory the more precarious becomes Japan's hold on China's trade.

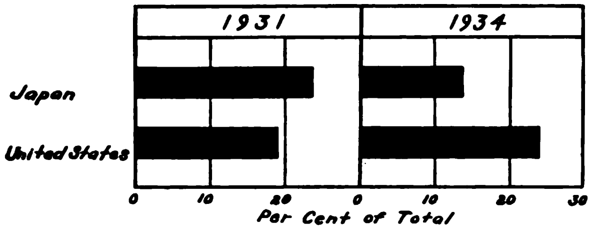

Fig. 2. Percentage of foreign trade of China with its two chief traders.

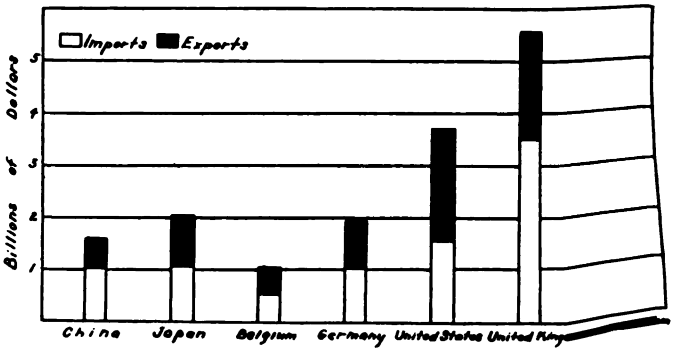

Fig. 3. Foreign trade of six selected countries in 1934.

The character of the trade of Japan is shown in Fig. 4. It is

ry importer of raw materials and foodstuffs and an exporter
nufactured articles. Besides this it has a slightly unfavorable
e of trade, tho not as unfavorable as that of China. In time
r a block in the sources of raw materials would mean the
se of its greatest industries; in time of peace, it must main-
greater balance between industrial consumption and indus-
export. Britain has an even more unfavorable balance of
but the things
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oblem, if it pro-
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e of world power, is to cut down the importation of fabricated
s by producing enough for home consumption. That this is
le has been shown, but the question as to how to pay for the
sing amount of food which must be imported is still a seri-
e.

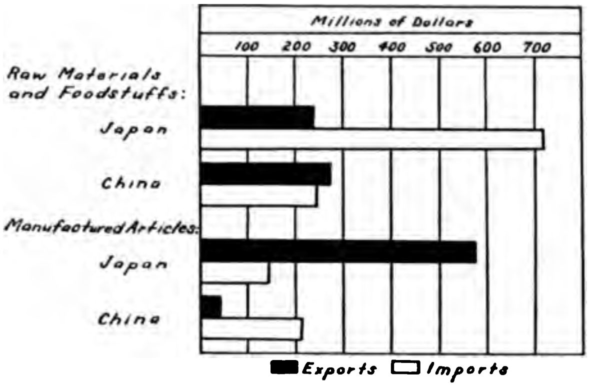

FIG. 4. Character of foreign trade in 1934. Calculated for leading items only.

CONCLUSIONS

the light of the foregoing considerations three things seem
nt: (1) that Japan, at present, far exceeds China in actual
ess, industrial development, and international prestige; (2)
hina possesses a sound geographical basis on which to rise,
tely, to a place above Japan in the Orient; and (3) that it
bable that neither country, now nor in the future, will equal
nations as the United States, Germany, or Britain in perma-
world power. The first conclusion is emphasized by many stu-
of world problems and is the idea running thru most articles
g with the two Oriental countries; the full import of the
d and third is realized by few. If stability of government in
. should ever make possible its actual emergence, and there

are signs that this is happening, the hegemony of Japan in the Orient will be challenged and China's fear of the Nippon empire may indeed become chimerical.

For figures and data, the author is indebted particularly to the following sources:

1. The United States Department of Commerce, Foreign Commerce Yearbook
2. Statesman's Yearbook
3. China Year Book
4. Japan Year Book
5. Joseph Barnes. Empire in the East
6. George B. Cressey. China's Geographic Foundations
7. Frederick Field. Economic Handbook of the Pacific Area
8. Harold G. Moulton. Japan, Economic and Financial
9. John E. Orchard. Japan's Economic Position
10. Problems of the Pacific. Proceedings of the Fifth Conference of the Institute of Pacific Relations, Banff, Canada, 1933.

FORESTRY AND THE PUBLIC SCHOOLS*

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U. S. Forest Service

In coming before this group of educators with the project I have to propose, I am conscious of the fact that the public school system is too often regarded by purveyors of new ideas and propagandists as a fertile field for promulgating their hobbies and ideas. Schoolmen, I know, are beset by those who would introduce their particular brand of education. The crowded curricula of many schools attests to the success of the proponents of some of these innovations and no doubt accounts for a certain attiude of suspicion and canniness on the part of schoolmen toward propositions of new subject matter for the schools. This is as it should be. I seriously question the wisdom of curriculum building by special legislation sometimes sponsored by lay groups for emotional or commercial reasons and without the endorsement of the school authorities. The determination of the elements of the curriculum can be safely placed in the hands of the public school faculties and left to the well considered planning of curriculum committees and to the professional judgment of the school heads.

However, I make no apology for advocating the teaching of conservation, and in particular forest conservation, in the public schools. Students of those social and economic forces that govern wood. The railroad empire is built on wood. The man in New York City who shrugs his shoulders about this forestry problem and says, "What do we need with more forests, we have steel and concrete and glass and all the other substitutes," does not know that not only the newspaper under his arm is made of wood, but the chances are the band of his hat, the rims of his spectacles, his suit, his necktie, his underwear, his socks, the insoles and other findings of his shoes, the hair comb, cigarette holder and the wallet in his pockets, and even the floor covering he stands on are entirely or in part made from wood. The pulp and chemical products of wood are now in as general use as is wood itself. Always foremost among the basic resources of industry, the development of the use of the pulp and chemical products of wood have vastly broadened this base, and since it is an organic and therefore a renewable resource, wood will continue to serve mankind as a basic industrial material after the mineral deposits are exhausted and as long as life continues.

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*Address to the National Council of Geography Teachers, Syracuse, New York, December 30, 1936.

Economic. From the economic standpoint, the service of the forests covers a wide range of benefits: The timber products for industry; forest influences upon water conservation, erosion, floods, droughts; the employment of labor in the vast reservoir of work which exists not only in the logging and the manufacture of the products but also in the culture, care and improvement of forest properties; and finally, as a form of great wealth the forests yield incomes for the support of populations and are taxable for the support of government. With one-third of the land area primarily of use only for growing of trees, any economy that does not keep that area fully productive is a wasteful policy that leads to ruin and disaster.

Social. The social aspects of forestry have until very recently been given but slight attention. I think the depression did much to focus public attention upon the social values in our forest lands. Heretofore, in similar crises we have had new lands on the frontier to turn to. The settlement of new territory has relieved the unemployment and has furnished sustenance to the needy. But in this depression there were no new lands to settle and the vast army of destitute and unemployed threatened to add social disaster to economic ruin. It was the forest lands, the cut-over lands and the devastated lands, where new forests must be planted, that furnished the way out. Productive work—new work that did not displace men herwise employed, and work that would return benefits to the iblic commensurate to its cost was available in the forests and uld be organized on short notice. The Civilian Conservation orps, the transient relief camps of the Emergency Relief Administration, the forest improvement projects of the Works Progress dministration, forest resettlement projects, and other works of nilar nature, supplied productive labor to many hundreds of ousands of men which knocked the dangerous peak off the overwering mountain of unemployment. But even before the depreson the social use of forests was expanding rapidly in the rise of pular outdoor recreation. This is a form of forest land use that is stined, I think, to exert a tremendous social influence. Last year ore than six million people entered the National Parks and enty-four million people visited the National Forests for recreaon besides the unreported millions who used other public and ivate forests for the purpose. With this use is associated the joyment of the wildlife resource including hunting, fishing, trapng and biological exploration.

In all these ways the forests serve. In one way or another they ert an influence upon the lives of every citizen of this country. ny common school education that does not include a knowledge the true relationship of forests to the public welfare is therefore complete.

Knowledge of Conservation Essential

Every person should have a sane common sense understanding the principles of land use, which are essentially the underlying inciples of conservation. Every person should understand how e use of the natural resources relates to his individual welfare. et him acquire this understanding in school and it becomes a part his educational background. He then believes in the principles wise land use, of conservation of its resources because they are rt of his educational background. This is demonstrated in the atudes of the people of European countries where these principles ve been taught for centuries. There, no one questions that the land ıst be kept productive, for, land is life. Economic necessity decrees No one questions that forests both public and private must be otected and preserved in a continuously productive state for eryone believes that he has a vital personal interest in this proctivity. America has now arrived at the point where this same tal public interest must be recognized and protected. The time has come when the public must know the true economic significance of broken forest industries, of devastated and abandoned timberlands, of bankrupt towns and counties, of a disappearing resource and of mounting timber prices. It must know the social significance of ghost lumber towns, rural slums created when forest industries moved away and the farmer's markets disappeared and, it should know what can be done, by reestablishing forests and combining forestry and agriculture, to rehabilitate the rural slums and the ghost towns into permanent productive communities. It should come to know also the true value to the nation of the esthetic influence of forested landscapes, primitive recreation areas and the protective shelter of trees.

MAKING CONSERVATION EDUCATION EFFECTIVE

How then, shall this educational background be acquired? Should forestry per se or a general course covering all phases of conservation be added to the curriculum? In my opinion, it is generally not desirable to teach the subject in a special course. This is not because it would tend to crowd an already overcrowded curriculum but because we are not trying to make foresters of everyone. The real purpose is to make the public conscious of the true economic and social significance of this thing called conservation. The best way to give the multifarious benefits of the forest their true perspective is to integrate the subject matter in pertinent courses already in the curriculum. In geography the industrial side of it, in citizenship or civics the social aspects will be taught. Beginning with nature study in the primary school thru the grades and high school, there is in the series of pertinent subjects included in the biological and social sciences an opportunity to bring out the relative value of every phase of forest land use. Every phase of conservation can be covered and in the various sections of the country the emphasis may be stronger on those phases that are of the greatest local importance. For example, in a region where erosion is a serious problem soil conservation should be stressed, and in timber producing states certain phases of forestry should be emphasized.

WHAT STEPS ARE NECESSARY?

There are three ways in which the project should be carried out:

First, some agency to stir the school authorities to action by pointing out the need and the means of satisfying that need. The nited States Forest Service proposes to assist in this by working ith the State Foresters, State Planning Boards and State Superntendents of Public Instruction, supplying subject matter and ata from its researches in every field of forest conservation, wood echnology and wood chemistry.

Second, the preparation of new up-to-date text material and eachers unit outlines.

Third, the teacher training colleges should be induced to give lementary courses in conservation so that teachers will have the ight background for teaching it.

In order to sound the attitude of schoolmen toward this project onversations have been had with representative educators thruout he country including state, county and municipal school superinendents and teachers. Invariably, the response has been favorable nd in the majority of cases it was found that the need for more ystematic teaching of conservation is already recognized and that n one way or another sporadic attempts are being made to supply he deficiency. In some schools it is given in special short projects, n others there are special programs to celebrate certain occasions ike Arbor Day or Fire Prevention Week. In a few states the law equires that conservation shall be taught in all public schools, ut by and large wherever there is any attention given to the subject t is due to the interest and initiative of some individual. This of ourse is precarious sponsorship for a project so important to ublic education.

In the state of Washington action has recently been taken which romises well for a constructive program and may serve to point he way for similar action in other states. Under the auspices of the tate Planning Board a committee, including some of the foremost ducators and foresters in the state, has been set up to assemble he subject matter and prepare textbooks on the economic and the ocial aspects of forestry. Since the committee brings together in ne cooperating group both conservationists and schoolmen, the rst to furnish the subject matter and the latter to organize it in uitable form and to use it, there should be no difficulty about the chools of Washington having up-to-date instruction in conservation. The auspices could not be more favorable.

The great primary need is for new text and reference material. That now available is woefully meagre and inaccurate. It is for the most part a rehash of the writings on conservation of twenty-five years ago. The conservation picture has changed very much in that twenty-five years. Many of the ideas of that day are no longer considered practicable and certainly there is much that is new and this must be made available to the teachers. The literature that reports the progress of these years is for the most part in the technical reports which have been published by the United States Department of Agriculture, by a few of the states, the forest schools, and to a very limited extent by private conservation groups. By far the larger part of the new data is to be found in the reports of the United States Forest Service. This information must be organized in such shape that the teacher can use it. The forester should interpret it but it should be written in the language of the classroom by someone who can give it a pedagogical approach.

Publishers who have been approached on the matter of publishing new text material have manifested interest, but it is obvious that there will be very little new material printed until the schools ask for it. Once there is a consumer demand for it the publishers will be quick to respond. The Forest Service stands ready to furnish them, or their authors, the factual data and grafs, charts and photographs for illustrations with which to prepare up-to-date texts. It also employs educational specialists who are qualified to extract from the mass of technical data such information as may be needed by curriculum committees or others engaged in the preparation of teachers' outlines and to interpret this information for them.

The Forest Service is also prepared to assist schools with special program material in the way of motion pictures, exhibits, lecture outlines, lantern slides, photographs and charts. This material is furnished without any cost except transportation charges. With such services available to the schools there is no longer any need to leave conservation out of the subject matter because of the lack of adequate material. This has been the reason given me by many teachers and it has no doubt up to this time been a very valid reason, but with the conservation agencies ready to help, any school system can provide itself with adequate teachers' material.

The subject matter taught in geography, perhaps more than any other subject in the curriculum, relates to many phases of conservation and, I would add, that the authors of geographies more than the authors of other texts seem to have sought to keep their material abreast of the times as regards conservation. I feel, therefore, that in this group I may be assured of a live interest in this effort to provide more adequate and accurate instruction in a subject that is so intimately related to the public welfare.

HOW BERRY GULLY WAS CONQUERED

Brice M. Latham
Soil Conservation Service

Within eight years a gully on a farm near Spartanburg, S.C., t 40 feet into the ground, and canyon-like, knifed its way thru out 1,000 feet of land. For years, no work was done to control is ruinous erosion, and finally the gully reached Bad Lands pro- rtions. More than 40,000 tons of soil were washed from the cut ich had been gnawing away at the farm fields thru which it -zagged.

This gash became known as the Berry Gully. It was the first lly to be treated by the Soil Conservation Service in the South ger River (S.C.) area and as a result of erosion control treat- nt, its growth was checked and the land stabilized. Berry Gully only one of many such damaging land gashes which have taken a avy toll from lands of the South and other sections of the country.

In the Southern Piedmont, where Berry Gully is located, the soil fine, most of the farm lands are sloping, and rainfall is plentiful d well-distributed thruout the year. There are many destructive llies in this section and most of these started in a small way, om water moving down terrace channels, from the drainage from barn, from furrows running straight up and down hill, or from ter flowing down sloping fields on which clean cultivated crops, ch as corn or cotton, were grown without proper accompanying asures of erosion control. Actual surveys show that millions of res of land in the Southern Piedmont have been virtually ruined erosion for the growing of cultivated crops. Gullies, large and all, have caused a substantial portion of this damage. Some of e winding gashes have cut deeply into the subsoil and even into e "C" layer, the lowest soil level, which is composed of freshly sintegrated rock which lies above the bed rock itself. These gullies e working headward with every rain. Smaller tributary gullies, ich drain into the main-trunk channel are getting longer, wider d deeper every year. They are turning once productive fields into wning, bare, dirt-walled gashes and are not sparing houses, barns roads if they stand in their way.

Berry gully was one of the worst known to soil conservation en in the Southern Piedmont. They began control work about ree years ago and helped farmers set up effective soil-saving and nd-stabilizing structures. Fig. 1 gives an idea of the kind of job they faced. There was little or no vegetation either in the gully or on the gully slope.

Methods first used to control erosion in Berry gully were somewhat different from those now in operation, but were satisfactory. Treatment involved the diversion of water from the gully head. This was done by terracing the sloping fields draining into the gully. The banks were sloped by pushing soil into the gully. Channel bottoms were stabilized by building log check dams in the channel to slow down the flow of water after rains and thereby reduce further cutting. The banks and slopes were then planted to suitable vegetation, such as locust, as an additional protection against washing. The entire gully was seeded to Italian rye, following spring lespedeza, and a band of honeysuckle was planted along the rim banks. Later, Bermuda grass was sprigged down the sides of the

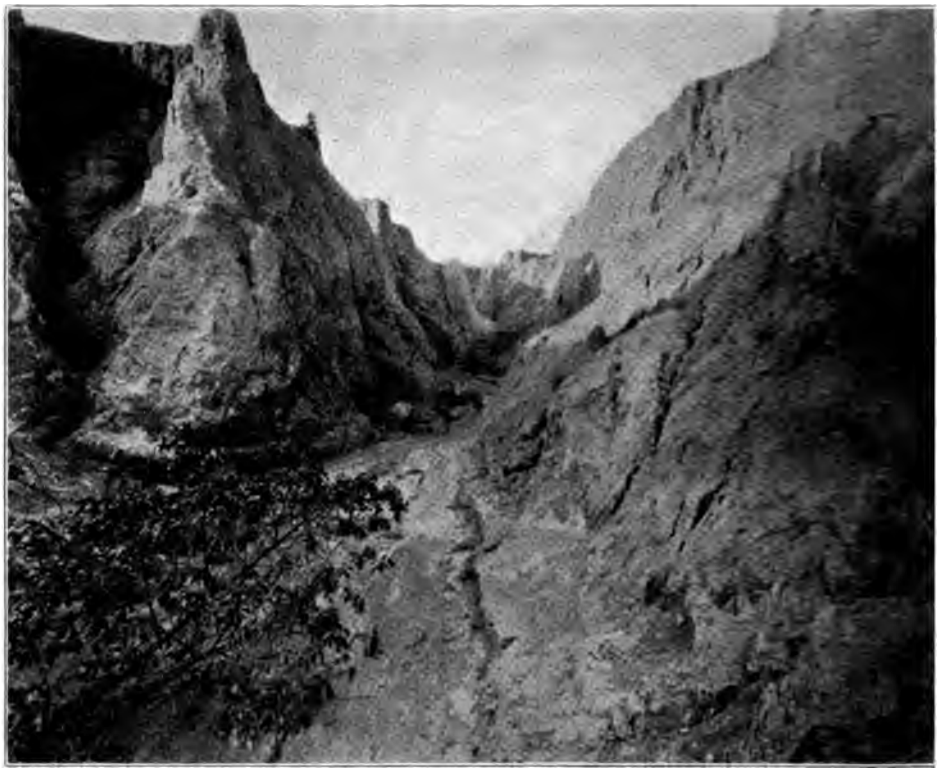

Fig. 1. Berry gully at its worst. Before measures were taken to halt erosion on farm lands drained by the gully, more than 40,000 tons of soil had been wasted thru this destructive earth gash near Spartanburg, South Carolina. The gully was 40 feet deep and 400 feet long.

from the structure when the gully first began to form, much damage could have been prevented," a conservationist recently declared. "Had he built terraces in the vicinity of the barn, sown the channel to some adaptable close-growing vegetation, all the desolation that hungry gully caused could have been avoided. . . ."

As things stand now, however, a country road has had to be changed several times, and the gully is approaching the present road from either side. Several homes, a school house, a church, a cemetery, even the barn from which the gully had its modest beginnings, have not been spared.

All gullies can be controlled if suitable and judicious soil-conservation measures are put into effect just as soon as the beginnings of the gullies are noticed. Control measures involve some or all of the approved soil-conservation methods, including terracing, contour farming, strip-cropping, and the building of inexpensive and easily constructed check dams.

CHANGES IN ROUTING RAW SILK FROM THE ORIENT TO UNITED STATES FACTORIES

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Roosevelt Junior High School
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Raw silk shipments from the Orient to the United States, to-day, are made chiefly, by the all-water route thru the Panama Canal to our eastern seaboard. Since 1934, this statement has held for at least 80 per cent of the raw silk our country receives from Japan and China. Practically all of that used in the Atlantic seaboard factories comes by the all-water route. This routing is in sharp contrast to that of the two decades preceding the year 1928.

That old romantic story of the fast transportation of a high-priced commodity reads as follows:[1]

> Silk is shipped to the United States from the Orient in the holds of Trans-Pacific liners. The time between Yokohama and Seattle is now from ten to thirteen days. A special train, the "Silk Special," awaits the arrival of the steamer; customs entries are made as the steamer speeds down Puget Sound and the cargo is released as soon as the ship docks. A bond is filed as surety in lieu of the original bills of lading and consular invoices, and the National Federation of Textiles Traffic Bureau later turns over these papers to officials who cancel the bonds. The cars are locked and the "Silk Special" roars out headed east. The rails are cleared and with only two stops to change locomotives, the silk train reaches Chicago in sixty hours, and New York in eighty-five hours. The record from Yokohama to New York is thirteen days, three hours, and eight minutes.

What is the story of present day shipment? The silk still travels the great circle route, some going directly thru the Panama Canal, while a certain percentage is unloaded at the Pacific Coast ports, thence, either, to be sent in baggage, express, or, freight cars, across the continent, or, to be trans-shipped on intercoastal steamers thru the Canal to Atlantic coast ports. Seattle held a strategic position in the earlier rapid transport era. Note the decline in its receipts of bales of raw silk:[2]

1931	*1932*	*1933*	*1934*	*1935*
105,330	88,688	62,742	22,106	39,248

There is a tendency to carry the silk to the port of Los Angeles for trans-shipment by intercoastal steamer, as evidenced by its increase of receipts, of 30 bales in 1925-6, to 57,000 bales in 1935-36.[3]

[1] Edith E. Becker, Librarian, The National Federation of Textiles, Inc., N.Y.

[2] Port of Seattle Yearbook 1936. Page 83.

[3] Board of Harbor Commissioners, City of Los Angeles, 19

Other ports receiving silk are San Francisco, and New Orleans, the latter sending considerable by train to the Chicago area.[4]

By 1934 New York was receiving 373,800 bales by the all water route and by 1935, 425,300 bales.[5]

Some silk travels in fast Japanese vessels or United States mail boats. The Board of Harbor Commissioners of Los Angeles, report: "The newer vessels discharging silk at this port are combination oil tankers and cargo ships. They will bring in silk, instead of carrying water ballast."

The decline in the price of silk is the chief factor in the change from the speediest, most expensive mode of transport—the water and land route—to a slower, less expensive one—the all-water route. The capital investment and the insurance rates on silk are lower, so, the buyer looks for a cheaper mode of transport. One middle western buyer[6] gives the prices he paid for raw silk, as: $13.00 a pound in 1919; $10.35 in 1920; and, gradually declining to $1.25 in 1935—an all-time low—and rising to $1.75 in September 1936, and $2.04 in December 1936. In 1924, when the price was $9.00 a pound, no silk was shipped thru the Panama Canal. The following table shows a close relation between the decline in price, and the increase in all-water shipments.

RAW SILK FROM THE YOKOHAMA MARKET TO UNITED STATES[7]

Year	*Quotations in Yen per Bale*	*Per Cent of Total Going Thru Panama Canal*
1926	1704	1.5
1927	1406	3.
1928	1339	5.5
1929	1302	18.
1930	843	34.
1931	635	58.
1932	711	57.
1933	756	74.
1934	542	80.
1935	701	87.

The Commodity Exchange of New York showed 87½ per cent of the total raw silk imports from the Orient coming thru the Panama Canal during the first half of 1936.

[4] Figures not at present available

[5] Port of New York Authority

[6] Mr. H. Pollak, Phoenix Hosiery Company, Milwaukee, Wisconsin

[7] Report for the year 1935. Japanese Government, Yokohama Silk Conditioning House, Yokohama, Japan

What caused the decline in the price of raw silk? One logical ause was the forcing down of the prices for luxuries and semiuxuries resulting from the world-wide business depression. An dditional reason was the increasing competition of artificial silk. ’aul K. Whang in the *China Weekly Review* for August 31, 1935, ives as another reason, “the wholesale dumping of cheap Japanese ilk in foreign markets.”

As the figures show, 12½ per cent of the imported raw silk omes east by rail from the Pacific coast. Most of this comes to the Chicago area. In October 1936, the railroads, which were rapidly osing business, and the mid-west manufacturers who wished silk hipments delivered as speedily as possible, pondered the following gures: The freight rate from Yokohama to New York via the Panama Canal is approximately $4.00 per hundredweight. The rate o Chicago from Yokohama via the Panama Canal to New York, hence by rail is $5.50. The rate to Chicago via Seattle, thence by ail to Chicago, was $6.00, made up as follows: ocean freight, $2.00, verland freight $4.00. The railroads met an agreement with the mid-west buyers to reduce the rate to $3.00 from the Pacific coast, nd change the type of service from passenger express to regular reight. The time from the coast to Chicago was increased from hree days to seven days. Only by such an agreement could the railoads hope to retain any portion of the silk trade.

Since the days when the fall of Constantinople led to the e-routing of manufactured silk around Africa, to the present day, istory is filled with records of changes in commodity movements. n the present case the change has resulted partly from the development of a competing commodity, namely rayon, partly from scienific development in Japan which leads to increased production, nd partly from decreased buying power. What changes will the uture bring?

EDITORIAL NOTES AND NEWS

Enthusiasm for winter sports has been capitalized by many resorts, shops, and transportation agencies which formerly catered only to summer tourists. Clean, powdery snow, frozen rivers and lakes, steep slopes and open country, bright sunshine, exhilarating fresh air, wild life, and the tang of the pine woods are nature's offerings attracting amateur and professional sportsmen, nature lovers, camera enthusiasts, and mere spectators. Special snow trains, professional entertainment, programs and treks sponsored by various organizations, and warm accommodations with blazing log fires and hearty food, comfortable wearing apparel, all contribute to the enjoyment. Added to that is the satisfaction of developing a new accomplishment, the thrill of a challenging hazard appeal of fine equipment and of new inventions, such as the skeeter, developed in Wisconsin, an inexpensive front-steering style of ice- and snow-boat which rides on special ski runners and is exceptionally fast as it sails on the snow as well as ice.

Willis H. Miller, instructor in geography in the Los Angeles Junior College, serving as Associate Consultant for the California State Planning Board.

The last Bulletin of the Nebraska Chapter of the National Council of Geography Teachers, Volume XI, No. 4, March 20, 1937, contains a number of practical suggestions for studies and activities centered around Arbor Day, Forestry Week, Forests, Pan American Day, and Land Utilization. Vera Rigdon, University of Nebraska, is the editor.

The *Business Education World* has decided to publish a second series of ten articles on economic geography in the high school, beginning with the September, 1937, issue. Dr. Ridgley will be the editor of that series just as he has edited the series of the current school year. The series will consist of round-table discussions on classroom problems. Contributors to the series may state their problems, indicate the nature of the difficulty encountered and solicit assistance. Or, both the problem and solution may be presented. Other papers may deal with teaching devices, teaching plans, or units of subject matter. Those wishing further information may write Douglas C. Ridgley, 516 South Clayton St., Bloomington, Illinois.

According to a recent release from the U. S. Department of Agriculture, total imports of corn into the United States from July 1, 1936, to March 31, 1937, are estimated at approximately 47,150,000 bushels, almost 90 per cent of it coming from Argentina. This compares with 29,260,000 bushels imported in a corresponding period in 1935-36 and with 9,824,000 bushels in 1934-35. The sailing time from the River Plate to North Atlantic seaboard ports is 26 to 28 days and to the Pacific Coast is 36-40 days.

Dr. V. C. Finch, Geography Department of the University of Wisconsin, will teach in the summer session of the University of California at Los Angeles.

The New York Geographical Association held its third annual meeting, May 1, at Syracuse University. The program included a field trip, a series of papers, and an address by Professor Erwin Raisz of the Institute of Geographical Exploration at Harvard. Dr.

George B. Cressey of Syracuse University is the president of the Association and Melvina Svec of the Buffalo State Teachers College is the secretary.

DR. S. S. VISHER, Department of Geology and Geography of Indiana University, is to teach at the University of British Columbia next summer.

DR. W. L. G. JOERG has resigned his position as Research Editor on the staff of the American Geographical Society to become Chief of the Division of Maps and Charts of the National Archives in Washington. The Archives was established by Congress in 1934 to preserve those records of the Federal Government having permanent administrative or historical value, and make them available for use in the business of the government or in the promotion of scientific research.

The biennial conference of the World Federation of Education Associations will be held in Tokyo, Japan, August 2-7. The Geography Section will conduct two sessions. The theme will be, "Promotion of International Good Will thru Geographical Education." Both geographic subject matter and techniques of geographic education will be discussed. Representatives from England, Japan, United States and elsewhere in the world will be speakers. Some of the topics to be presented are Recent Developments of Geographical Education in Japan; Changes of Distribution of Population in Japan since 1870; How to Realize International Exchange of Geographical Teaching Materials; and Methods of Teaching Map Reading to Little Children. Details concerning these sessions can be obtained from Erna Grassmuck Gilland, Secretary, Geography Section, California, Pennsylvania.

In connection with the annual meetings of the National Education Association to be held in Detroit, June 27 to July 2, there will be two Geography Sessions. All teachers and others interested in geographic education are invited to attend these sessions. Programs and other details can be obtained from Erna Grassmuck Gilland, California, Pennsylvania, who is Chairman of the Educational Relations Committee of the National Council of Geography Teachers.

DR. DAVID J. SWARTZ, Chairman of the Geography Section, New York Society for the Experimental Study of Education, reports a recent meeting of the Section addressed by Dr. Stephen F. Bayne, Associate Superintendent, Department of Education, City of New York, on "Geography for All the Children." At another meeting, the topic, "Geography in All the Schools," was presented by Assistant Superintendent Fredric Ernst.

News reports state that the province of Chahar in Inner Mongolia has separated from China and is to be independent and known as Mongukuo. The inhabitants are Mongols, nomadic herders. Another change reported is that Charlotte Amalie is the new name for the capital of St. Thomas, one of the Virgin Islands, famed for its bay rum distilleries.

The spring meeting of the Boston Association of Geography Teachers was held in April in the Boston Teachers College. The main address was given by Mr. James H. Powers, news commentator and lecturer. Mary T. O'Connell is the president of the association.

GEOGRAPHICAL PUBLICATIONS

L. Dudley Stamp. **Asia.** 704 pages, 372 illustrations. E. P. Dutton and Company. New York. Revised Edition, 1936.

Dr. Stamp's residence and travel in the Orient enables him to present a vast amount of factual material in a pleasing and authentic manner so that the book has been well received since its first publication in 1929. (Reviewed in JOURNAL OF GEOGRAPHY, April, 1930, page 175.) Seven short chapters on the continent of Asia are followed by discussions of each of the major political divisions. The sections on India and Burma are particularly good. The portrayal of the natural elements of landscape usually is superior to that of the cultural elements. Altho the half-tones commonly used in American texts are lacking, the book is exceptionally well illustrated. A number of grafs and nearly 300 black and white maps are skillfully used to present facts and ideas. American writers might well make greater use of these devices.

The new edition retains all of the features of the first. Statistics are brought up to date thruout the text but the maps are less completely revised. A brief treatment of the climates of Asia according to the Köppen and Thornthwaite classifications is added. Population changes in India are illustrated by three maps and more attention is given to that country's industries. The discussion of the "natural" regions of Burma and Ceylon is amplified and several maps added. The chapters on China, Japan, Manchuria, and Asiatic Russia are expanded from 137 to 201 pages by materials drawn largely from the works of Cressey, Trewartha, and other American geographers. This improves the book's balance, altho India and Burma are still given as much space as these four countries together. On the whole, this is probably the most satisfactory text and reference book in English on the continent of Asia available to geographers.

E. M. SCOTT

University of Wisconsin

Griffith Taylor. **Environment and Nation. Geographical Factors in the Cultural and Political History of Europe.** 571 pp., more than 200 maps. University of Chicago Press. 1936. $4.00.

Dr. Taylor was for several years, Professor of Geography at the University of Chicago, prior to which he was for many years head of the Department of Geography at the University of Sydney, Australia. He recently became the first head of a department of geography in a Canadian university, Toronto. Dr. Taylor is known the world over by scholars as a highly original, exceptionally stimulating man. He is an indefatigable worker, the author of a score of scholarly volumes, containing many hundred original maps.

This volume is a sequel to his Environment and Race (1927), which deals with the origin of races and their dispersal over the earth, mostly prior to 500 A.D. Here he studies the evolution of European nations from about 500 A.D., or before, up to recent times.

First, for Europe as a whole, and then for each of the major countries he traces, with the help of numerous ingenious maps, the development of the geological background, and then sketches the chief environment conditions. These maps are much generalized, but are highly illuminating, partly because many of them treat of environmental conditions seldom mapped.

This book differs radically from the conventional discussions of the history and geography of the various European countries. As a result of extensive first hand knowledge, supplemented by the study of hundreds of scholarly works in several languages, Dr. Taylor builds upon a foundation much more secure than that possessed by almost any other writer on Europe.

This scholarly work will be very useful to such teachers and advanced students of the geography or history of Europe as are striving to understand conditions in Europe. Indeed in no other three books is there as much illumination on the fundamental background of modern Europe.

STEPHEN S. VISHER

Indiana University

A. E. Parkins and J. R. Whitaker (Editors). Our Natural Resources and Their Conservation, 650 pp., 108 illustrations, 41 tables. John Wiley and Sons, New York, New York, 1936. $4.00.

Unquestionably, Our Natural Resources and Their Conservation is the finest textbook yet written on this subject. Twenty-two scientists have coöperated with the editors in preparing an up-to-date book suitable for work of junior or senior college level. Teachers, students and laymen will enjoy the clear reading and logical arrangement of this volume.

In keeping with the ever increasing importance and scope of conservation, new topics such as "Recreational Resources," "Conservation of Man," and governmental planning are included in this book along with the traditional topics. The results of recent extensive research used herein, give quantitative substantiation and animation to concepts held about the traditional topics such as soil erosion, etc. The essence of the book is "a balanced, concrete view of resources and problems in their actual setting as a part of the organic units involved, whether regions, states or the nation."

The philosophy of conservation found in the preface should not be overlooked, nor should the twelve pages of selected bibliography arranged by chapters in the back of the book.

That such an excellent book has been written at this time is fortunate. With mounting floods, droughts and dust storms, the public has become keenly interested in our natural resources and their plight. Some state legislatures have passed laws requiring that conservation be taught in elementary and secondary schools, compelling teachers to take a course in conservation before certification. Besides being an excellent text and reference book, this volume's chapters are admirably suited for the layman's leisure reading.

The book holds a delicate balance between the present situation and long range viewpoint, concepts and facts, theory and practice, and provocative thinking and conclusion.

THOMAS F. BARTON

Southern Illinois State Normal University

Albert Herrmann. Historical and Commercial Atlas of China. 112 pp. Harvard University Press, Cambridge, Mass. 1935. $5.00

This is Volume I of the Monograph Series, of the Harvard-Yenching Institute. The first three maps present China's Situation in the World, Physical Geography and the Boundaries of Ancient China, and Prehistoric Sites in China. The historical evolution from The Beginnings of Ancient China, 1900-1300 B.C., to the present time is treated in much detail by many maps in sequence. These maps represent an enormous amount of painstaking research and will be invaluable to the geographer and historian.

The commercial maps treat agriculture, livestock, minerals, industries, traffic and communication. A very large amount of information has been included without seriously crowding the maps. The atlas also carries a selected bibliography, and extensive index, and a list of Chinese characters.

G.J.M.

William F. Petersen. **The Patient and the Weather.** Four volumes, pp. 14 811, 550, 391; illustrations, mostly grafs and maps, 94, 362, 249, 19 Edwards Brothers, Ann Arbor, Mich. 1935, 1936.

Dr. Petersen, Professor of Pathology in the University of Illinois Medical Schoo has made an exhaustive study of numerous phases of health as associated or correlate with the weather. This treatise is written from the medical point of view, but its nu merous maps and many of its discussions will interest geographers.

Some of the chapter topics which suggest aspects of especial interest to those inte ested in geography are: (Part I of Vol. I) Influences of storminess in America; raci contrasts in susceptibility to disease; some influences of the changed environment America upon immigrants and their offspring. The scores of maps of this volume, sho ing the distribution of as many physical defects or diseases discovered by the Unite States Army Draft afford a mass of geographic data of much interest. Other unusu maps, based on the United States Census are equally interesting, for example, that th southern states have relatively few people older than 55, white or colored.

Part II of Vol. I has 781 pages and is devoted to a study of the effects of a mospheric changes upon various physiological conditions. Vol. II considers variati with the weather of various bacterial diseases. Vol. III studies the effects of the weath on mental diseases.

Dr. Petersen has presented many highly significant data of conditions correlated, or at least suspected of being correlated, with the weather. Geographers can find much to ponder in these ponderous quartos.

Stephen S. Visher

Indiana University

NOTE

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Editor

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THE LEIPZIG TRADE FAIRS

EUGENE VAN CLEEF
Ohio State University

Leipzig has been an important trade center for many centuries. Its markets which may be considered the ancestors of the present famous Trade Fairs were of sufficient influence to have been noted in a charter granted to the city by Otto the Wealthy about 1170 A.D. They were mentioned again in "a title deed dated 1268" sometimes considered the year of birth of the Leipzig Fairs, indicating that by this time, the fairs were well established institutions. Margrave Dietrich, ruling autocrat, promised protection to visiting traders from enemy lands even during wars.

In mediaeval times Leipzig enjoyed certain geographic qualities which favored the growth of trade. The city was located at the crossroads of north-south and east-west trade routes in the state of Saxony, a location advantageous to merchants wishing to exchange commodities in the immediate environs. Three small streams, the Pleisse, Elster and Parthe focus upon this locality. They are of little consequence today, but at that time, they afforded good avenues of transportation. Furthermore, these rivers converge in a manner which made their crossing easier where Leipzig evolved than at any other point in the vicinity. The city is not far removed from the Elbe and Saale rivers, two other busy natural trade routes.

LEIPZIG ADVANTAGES

The physical map of Germany shows Leipzig to be located on the level, glaciated plain fringing the outlying low slopes of the Erzgebirge (Ore mountains) bordering the northwest side of rich Bohemia in Czechoslovakia. It is also at the eastern gateway to the delightful district of Thuringia, lying in the depression between the Harz Mountains and the Thuringian Forest. Only Halle among the nearby large trade centers has a somewhat similar location and could hope to compete with Leipzig for the same trade. However, Leipzig not only enjoyed the geographic advantages just described but received certain political favors which destined it to out-distance Halle.

In 1497 Emperor Maximilian I, contributed to the economic advantages which the natural setting gave to Leipzig by granting official status to the Fair. In 1507 he arbitrarily ruled that within a radius of 15 German miles (68.5 English miles) no other fair could operate. Thus, Halle, Erfurt and Magdeburg were eliminated from competition and Leipzig's strength in turn was increased as a competitor of Frankfurt on the Main, Nürnberg and still other fair centers.

WORLD INFLUENCES

But these advantages were not all. As the trade of Venice, with the Black Sea district declined owing to the rise of Turkish power along the European-Asiatic overland route, Leipzig profited. Goods for central and southeastern Europe came by oceanic routes and entered the continent via the North Sea. Some of this traffic was diverted to Leipzig. Then too, the discovery of the Americas followed soon by the decline of the Hanseatic League, allowed Leipzig to share further in the trade of central and southeastern Europe. Thru the subsequent centuries down to the present, Leipzig suffered from disturbing elements such as the Thirty Years' War, the Seven Years' War, Napoleon's invasion of Russia via routes thru Leipzig, and the World War, followed by bankruptcy in Germany. Nevertheless, each time the city not only came back undaunted but went forward at an increasing tempo. The fair preserved itself just as the city had done.

To appreciate the rise or decline of trade in various regions of the earth, we must be impressed by the fact that until about the 19th century, cities were usually as powerful and influential as states or nations. Cities often came into direct conflict with each other. Thus, the rise of an organization such as a fair was in a large sense dependent upon the strength and fortunes of the city in which it was located.

CHANGES IN FAIR CHARACTERISTICS

Fairs originally were not of the sample type but of the commodity class.* Until the beginning of the 19th century, the business of ie fair was retail in character. Groceries, cotton and raw wool had een of prime importance in the Leipzig trade but later gave way furs, leather and dry goods as the principal commodities. As ertain items were dropped, new ones were introduced, such as iina, glassware, hardware, novelties, musical instruments, machin-y, and a host of other goods, until today the kinds of commodities in into the thousands. Paralleling the shift in types of merchandise iere came about a change from the retailing to wholesaling of ares. Today the rules of the wholesale trade are rigidly enforced

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* A sample fair is one in which orders for later delivery are taken on the basis of samples displayed, whereas a commodity fair is one in which the goods displayed are sold direct either for money or for other goods.

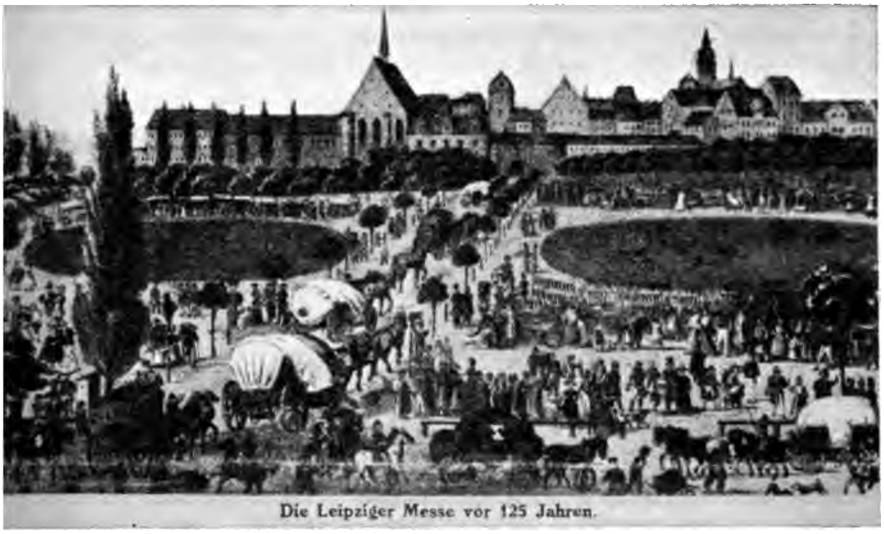
Die Leipziger Messe vor 125 Jahren.

Fig. 1. Approach to the Leipzig Fair 125 years ago. At this time, the fair was of the mmodity type, merchants coming with loads of goods in their covered wagons to barter ith each other. In this scene they are headed toward one of the city gates. Courtesy, eipzig Trade Fair, Inc.

nd the fair is sometimes designated as "The Leipzig Wholesale 'air."

Thus in this transformation from a commodity fair to a sample air the scope of activities was vastly extended. As long as goods ere brought to Leipzig for immediate sale the trading area was rgely local, that is, those who came to the fairs lived within a few iiles of the city. The limited radius of activity was affected too by ie weather and condition of the roads. However, as communica-ion facilities improved and the reputation of the fair as an im-ortant market center spread far and wide, the numbers of traders icreased enormously. This increase eventually made it imprac-cable to continue the fair on the basis of direct trading. There was not the space for storing the goods nor was it feasible for these buyers to try to take home with them the large quantities of commodities purchased. The system shifted to that of sample displays. Today, as a mere incident to the major activities, one may see a few small merchant stands where goods are sold direct, a sort of souvenir from the days of the oriental bazaar, but such sellers do not have official status in the fair.

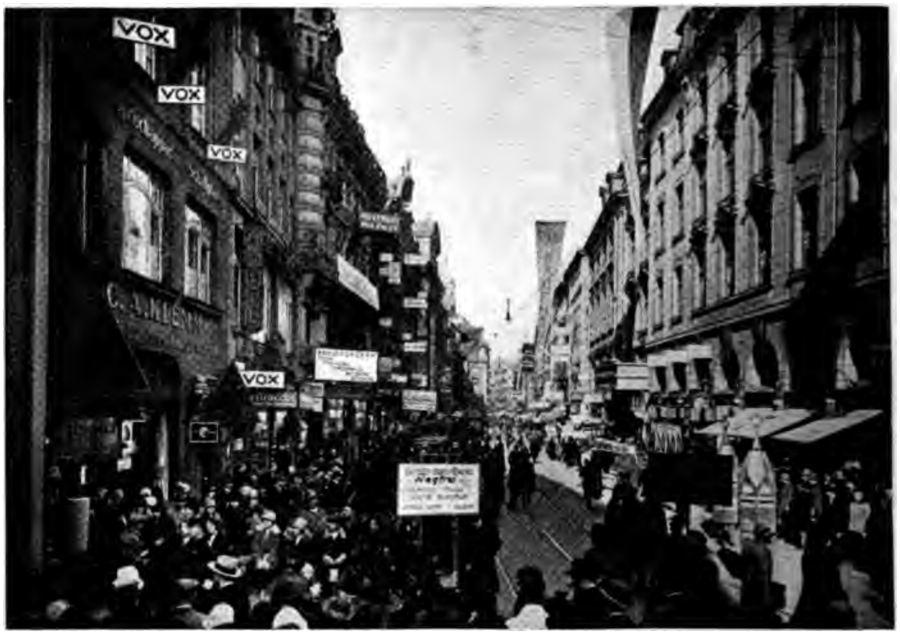

Fig. 2. A typical street scene in old Leipzig where the carnival spirit sometimes prevails. However, the serious business of the fair takes place quietly in the numerous lofts above the street floors of these buildings. All traffic except pedestrian ceases during most of the day. Courtesy, Leipzig Trade Fair, Inc.

The change from a commodity fair to a sample fair was not easily accomplished. In fact, the improvement in communications which we have just mentioned, tended to destroy fairs. There was no longer need for merchants to visit a central place to see the goods which they bought. The "industrial revolution" made possible the manufacture of goods exactly according to sample. Manufacturers could send their salesmen to visit prospective customers and save the customer the inconvenience of the older methods of doing business. By about 1850 even the Leipzig Fair had outlived its usefulness.

hibitors sell much of their production for shipment beyond the boundaries of Germany while the buyers of these goods, residents of foreign lands, are the importers. The fair has become international and intercontinental.

The Leipzig Fair has no official connection with the city government of Leipzig, nor is its organization limited to citizens of Leipzig. The fair is managed by an independent corporation. Of course, local business men are interested. The Chamber of Commerce, travel bureaus, hotels and others lend such assistance as they can to further the success of the event because they benefit from the vast throng in attendance. However, all responsibility for the conduct of the fair is assumed by a fair administration known as the Leipziger Messamt, which has its own building and staff for governing the entire proceedings. Nevertheless, the entire city seems to acquire the fair spirit and all lines of business naturally attempt to capitalize the opportunity afforded by the presence of thousands of visitors. Much unique advertising is displayed either in the form of placards and other types of literature or thru the medium of the show window. Humorous advertisements by way of clowns and grotesque figures parading the exhibit streets, arouse the interest of the spectator and attract the attention of the passing potential buyer. In the narrow streets of medieval origin banners and signs in abundant variety displayed from thousands of windows lend color and a carnival aspect to the urban landscape.

Space for exhibitors is available in thirty-one permanent buildings erected for the merchandise Fair in the inner city and eighteen large exhibition halls at the exposition grounds on the city outskirts. The buildings in the inner city house the general trades group, officially called the General Sample Fair and the outlying buildings house the technical group known as the Great Engineering and Building Fair. With the post-war addition of the latter fair there is represented nearly every conceivable type of commodity produced by occidental countries, except perishables—a truly remarkable annual exposition.

EXHIBITORS AND BUYERS

Altho exhibitors in the earlier years of the Leipzig fairs were almost entirely from the state of Saxony, today they come from all parts of Germany, from neighboring countries, and from over-sea. They total annually about 8,000, 12 per cent of whom come from foreign lands. Foreign buyers number into the thirty thousands and German buyers about 180,000. In all, seventy-four countries ere represented at a recent fair. Exhibitors came from twenty-our countries, about sixty of them from the United States. Sight-eers constitute about 12,000. A fair which can bring to its doors ich large numbers of buyers representing wholesalers and dealers om all quarters of the globe merits high regard.

Thus far, we have considered but one fair. Actually there are ree fairs held annually, one in the spring which we have been scussing, one in the autumn and a third in January, the last one ten called the January Fur Sales, but in every respect a trade ir. The Autumn Fair, nearly as important as the Spring Fair, is ld, usually, the latter part of August and early September.

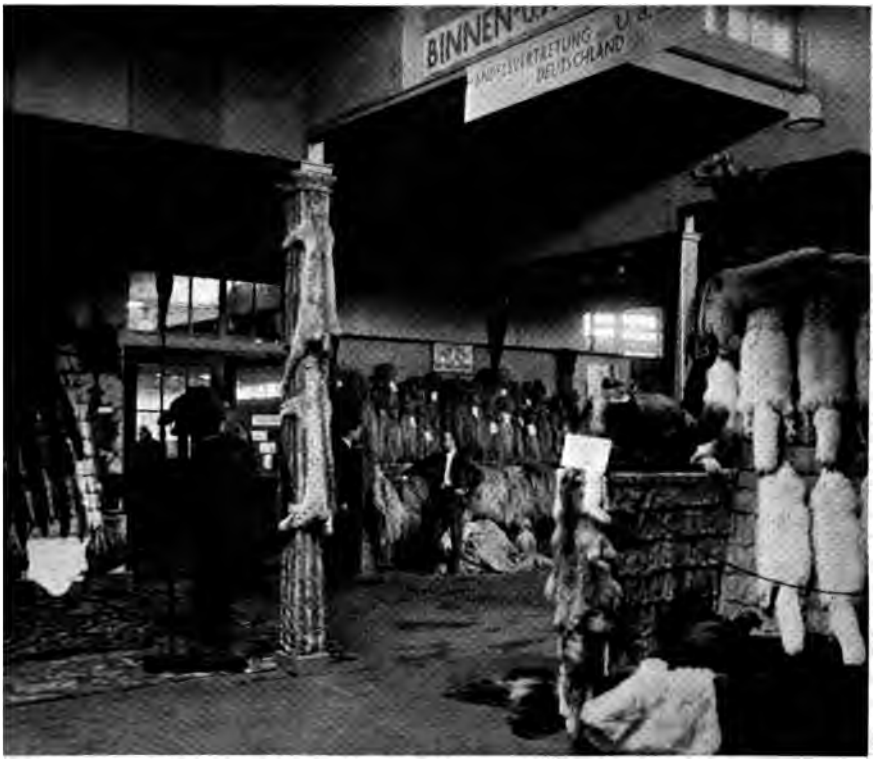

Fig. 4. Furs from everywhere. Such scenes as this one are characteristic of the nuary fur sales, a form of commodity fair. Leipzig ranks as the world's foremost fur eing center and one of the leading centers for the sale of all types of furs. Courtesy, ipzig Trade Fair, Inc.

THE FUR FAIR

The Fur Fair operated independently of the Leipzig Trade airs, is notable. For many decades until the World War, Leipzig was not only the world's principal fur dyeing center but enjoyed a monopoly in this respect. Now it has competition in the United States. At one time, it was the world's largest fur collecting center and primary market, but today London is an important rival. Many United States fur buyers visit Leipzig's Fur Fair to purchase dyed pelts, some of which are of North American origin. These men may view a wide assortment of furs from all parts of the earth, pelts sent to Leipzig to be dyed under the skillful supervision of the best dyers. The Fur Fair is a commodity fair, for in this instance buyers see all of the furs which they purchase. There is little buying from sample. However, they themselves do not take home the skins, the seller making the shipment.

OTHER SAMPLE FAIRS

Until the World War the Leipzig Sample Fair was the only important one of its kind. Nizhni-Novgorod (recently named Gorki) in the U.S.S.R. was the scene of a unique commodity fair and gained world-wide fame but never attained the size or economic importance of the Leipzig Fair. Since the war, cities in other nations and other cities in Germany as well, have adopted the Leipzig idea and are holding annual trade fairs, but none of them is comparable with the Leipzig Sample Fair. Thus, these great fairs have persisted and have acquired renewed energy in the post-war era, as other centers have seen fit to foster the fair as a device to increase both national and international trade.

SUMMARY STATEMENT

Each of the fairs presents in a way, a cross-section of the economic-geographic activities of a local community or a nation. Each displays not only the major commodities used direct by the masses, but the raw materials which originate within the respective countries and a number of those imported for use in local manufactures. Many of the commodities reflect the economic and social activities growing out of geographic conditions. Wearing apparel, sports equipment, cooking utensils, color finishes, textile materials all tell their own story of the natural environment in which they have been developed. We may see in these fairs a combination of geographic, economic and political elements at work, but in no case is the success of the particular fair independent of the geographic setting in which it has arisen.

THE ATTRIBUTES OF PLACE*

W. ELMER EKBLAW
Clark University

To present to the members of the National Council of Geography Teachers the concept of place, and the attributes of place, as the essential core of the science of geography, may be carrying coals to Newcastle; but the growing importance of geography in our educational system would seem to justify attempt at a statement of the essential theme of our science, definition of the field which we have preëmpted, and which we may reasonably defend as our proper realm of research and endeavor.

The contraction of distance by improved facilities for communication and transportation and travel, the intimate interdependence and mutual interest of all lands and peoples, has transformed our whole world—our whole Oikumene in classic parlance—into one neighborhood where no people may live in ignorance of the rest of its folk. Only geography can provide the knowledge necessary to such intimate neighborliness.

Tho geography in America has not even yet attained the degree of influence and utility that it has achieved in most of the countries of Europe, it is slowly but surely pressing forward to a position where it will be indispensable, both in the cultural and professional aspects of education. The potential rôle of geography in future cultural, professional, and industrial activities of the world is apparently not fully appreciated by educators themselves, possibly not fully realized even by our teachers of geography; but certain it is, that the time is now at hand when there can no longer be any doubt of its educational value in the school curriculum. It is because of the inevitable place in our educational system that geography must very soon occupy, that any attempt to clarify its principles or to define its content, is justifiable. It is in this belief that I venture to lay before you in this paper the concept of place and its attributes as the very essence of geography.

THE ATTRIBUTES OF PLACE

Thruout history the concept of place has been the criterion by which fact and principles are popularly and generally classified geographic. To the lay man the world over, geography relates to place; and it is this historic and popular concept of place, and place attributes, upon which the whole science and discipline of geography have been formulated and established.

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* Presented at the meeting of the National Council of Geography Teachers, Syracuse, New York, December, 1936.

The fundamental concept of history has ever been time and time sequence; of biology, living organisms and their form and function; of astronomy, the heavenly bodies and their spatial relationships. Whenever we say botany we think of plants; whenever we say ornithology we think of birds; whenever we say mathematics we think of numbers; and so, whenever we say geography we just as naturally, and just as surely, think, or should think, of place.

If place be accepted as the essential concept of geography then the content of geography can be logically and reasonably determined. Its discipline can be definitely established upon the criterion of place. Its field can be definitely restricted to the attributes of place, and by the boundaries set up in that criterion. Facts or principles that involve the concept of place in any of its attributes or relationships, thus become definitely geographic, and amenable to geographic discipline. Fact or knowledge that does not apply to an attribute or relationship of place is not properly geographic, however significant it may be in itself.

All place relationships or attributes of land forms, or rainfall, or ocean currents; of maize, or micro-organisms, or soils; of man, or language, or even of farm walls and fences; all or any of these fall within the proper definition and field of geography. We might with equal propriety speak of the geography of man; of the geography of soils; of the geography of disease; of the geography of corn; or of highways and bridges even. The criterion by which we decide whether or not a fact or principle, or any body of knowledge relating to anything, is geographic, is whether or not it involves the concept of place and its attributes. The three essentials in every situation, in every drama, are the time, the place, and the thing; and as time implies history, so place implies geography.

THE FIELDS OF GEOGRAPHY

The earliest geography was chiefly concerned with local attributes of place. Because travel and trade were long restricted by ineffective technique and inadequate equipment, the horizons of early peoples were naturally close, and place knowledge intimate and personal. With development of navigation and expansion of discovery and exploration, place knowledge became widely extended, the most fundamental attributes of place became the concern of geographers, and map-making based upon the discovery and description of places, flourished as never before or since. The geographer's major interest then lay in location itself, that is in place itself, and its attributes lapsed into minor interest.

With discovery and exploration in large part completed, the concern of geography turned to special attributes of place; and out of the mass of knowledge collected and accumulated from world-wide discovery and exploration, a number of new sciences were developed, some of them distinctly related to geography, in that a large part of their fact was more or less resultant upon the study of place, even tho their major content came finally to be quite independent of place relationship.

Physical Geography

For a long time physiography, including oceanography, dominated geography, because land form—relief, contour of coast, drainage, and so forth—and sea characteristics—currents, tides, salinity, and so forth—are so fundamentally a part of the place concept that they can not be separated from it. During this period physical geography consequently and naturally played an important rôle in the subject matter of the school curriculum. The facts of physical geography still remain so important a part of the complex of place attributes that they can not be neglected or ignored in any study of geography.

Similarly, climatology includes such fundamental place attributes and relationships that geography is not complete, and can not be taught, without reference to the facts and principles of climate. Climate is as indispensable a part of geography as is physiography. No place is without climate. Climate is a major and inalienable attribute of place. Climatology is thus not a subject related to geography, but necessarily and inescapably a part of geography. There are few, if any, facts or principles of climatology which are not directly attributable to place; hence climatology must ever be included as one phase, and a major phase, of geography.

It might be well to point out that the ultimate control of climate is extra-terrestrial; that it is to the radiant energy from the sun primarily that the phenomena of climate must ultimately be ascribed; but it is upon the qualities of terrestrial place, chiefly its physiographic and oceanographic characteristics, that all variations in the elements of climate are determined. Likewise, tho some of the attributes of place included within the context of physiography and oceanography depend upon the almost infinitely and long time sequence of events that form the province of historical geology, most of them are related to other contemporary factors even more closely.

The newly organized and newly established soils science, because so much of its content is dependent upon the attributes of place, is closely related in many ways to the several phases of geography. It is distinctive in that it affords the most complete and composite measure of other attributes of place. Soils are more expressive of the aggregate current environmental factors at any place than any other phenomenon. Relatively, they are "the present day product of the present day environment." They are little affected by the long geologic evolution of the parent material of which they are formed, and of the land forms upon which they are distinctively developed. They reflect every attribute of the climate of their place, without being significantly affected by the direct action of the sun, which so closely controls climate. They have no vital power within themselves of adapting themselves to any influence, either consciously or unconsciously, genetically or individually, as have plants and animals. They are not mobile. They have no power of volition or of wittingly modifying their environment as has man.

Consequently they manifest more or less directly and obviously the effects of nearly all attributes of any place—the character of the underlying rocks and the surface terrain; the depth of the water-table, the adequacy and trustworthiness of rainfall and of season, and the vicissitudes of temperature and humidity; the character and extent of plant cover and animal life; and above all many of man's activities as they affect the land itself. Soils geography henceforth bids fair to afford one of the most satisfactory and illuminating opportunities for the application of a strict geographic discipline.

BIOGEOGRAPHY

The biogeographic attributes of place, which logically fall within the purviews of plant geography and animal geography, introduce a number of new and distinctive qualities and concepts. All organisms possess within themselves, in lesser or greater degree, the power of adaptation, the vital response of all organic life to the nts of the environment. The quality of adaptability is not a but a decidedly variable factor, which shapes each plant, and egetation of which it is a part, to a definite character and ion. Animals as a group possess as much genetic adaptation to actors of their environment as do plants, but individual ani- represent rather fixed form and size, quite in contrast to ide variability in size and form of single plants.

ew individual plants have the quality of mobility which most als, including man, possess to a distinctive degree. Their mo- enables animals generally, or in some measure, to escape one environment that might prove unsatisfactory or disas- , to an other that might, or might not, be more tolerable. Ani- can modify their adaptation to one environment which has ed them, by their response to another into which they migrate. tability and mobility constitute two very important phenom- hat modify the attributes of place tho they are not in any attributes of place as such, but of organisms. Plant and animal aphy are thus phases of geography vital to teaching.

Human Geography

ecause he is adaptable as plants and animals, more mobile as us than either plants or animals, and in addiiton possesses distinctive—we might almost say divine—power of electing wn course, of not only choosing for himself his own way, his haunts, his own manner of life almost, and his own environ- , but of modifying according to his own wish, his own likes and es, the environment which affects him; because of all these gatives, man occupies a distinctive place in the geographic lex. By his own volition and his own efforts he can profoundly, nly within definite limits, alter the attributes of his selected . He not only possesses the power of adapting himself to his onment, but of consciously adapting his environment to his omfort and convenience. It is a power which plants possess in degree but unwittingly, and absolutely without volition, and h animals possess in greater or lesser degree, but not in the sense or to the same extent as man. Man by his mobility may e the attributes of a place that does not suit him; by his tability he may and does adjust himself both consciously and nsciously to attributes of the place that he chooses, whether they suit him or not. Most significant of all he may, by his wit alter many of the attributes of place that affect him.

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Approaches to Geography

The discipline of geography may be oriented in a multiplicity of directions, as for example, topical geography, comparative geography, regional geography, or a number of others, each with its own advantages and its purposes. The objectives of any approach may be, and generally are, as fully geographic as the others, provided that the essential concept of place and place relationships is conserved and applied.

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Comparative geography is less likely to lead away from its discipline, because the bases for comparisons and contrasts are almost invariably those of place or locality. The attributes of one place are compared with similar attributes of other places, and the composite character of the places compared is thus developed. Thruout comparison the concept of place dominates the study, the teaching. The comparative method in geography lends itself naturally and hence, easily and effectively, to the discipline of place and its attributes. It constitutes a most stimulating approach to geographic problems.

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The purpose of this paper has been to emphasize the significance of place and its attributes in the organization of the science and discipline of geography. Without such discipline as the application of place criteria affords, geography ceases to be geography and becomes part of some other science. The discipline of geography, if the concept of place and its attributes be accepted as the core or essence of our science, is a distinctive and valuable element in cultural and professional education that cannot be neglected. It should not be dissipated by confusion with other valuable and useful disciplines.

If the paper has helped to crystallize the meaning and scope of geography, to clarify the objectives of our geographic study and teaching, to evaluate briefly the rôle of some of the phases of geographic lore, and to appraise even more briefly the merit of some of the approaches to geographic research, it has more than served its purpose.

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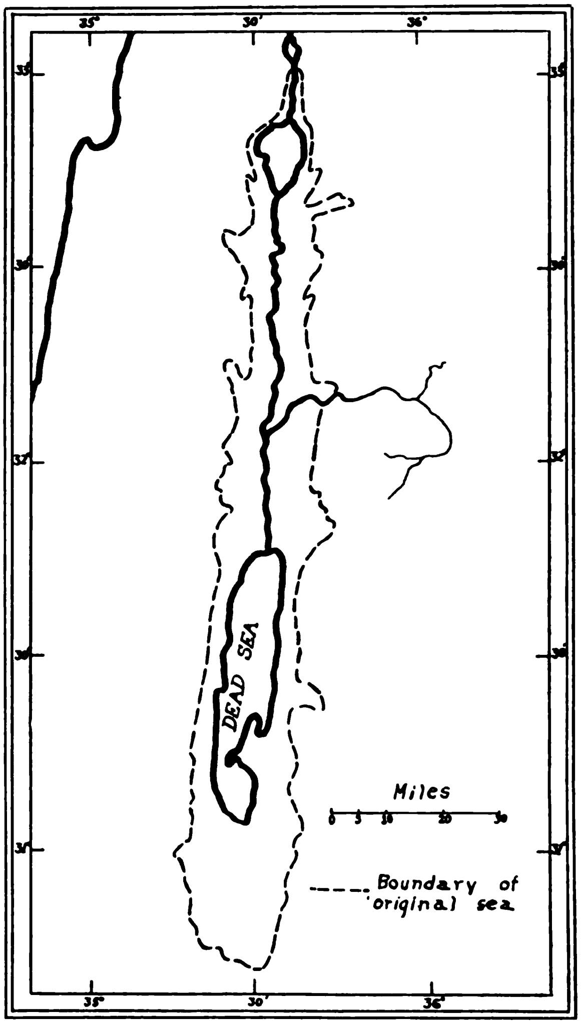

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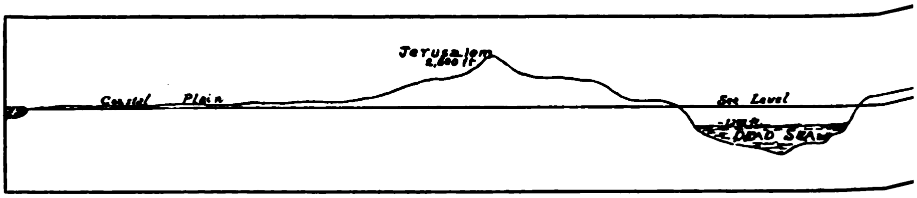

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Rapidity of production could be increased by spraying the brine into the pans and thus hastening evaporation. Common salt is the first deposit in the pans, followed by "carnallite" crude potash, which is decomposed in the refinery and muriate of potash produced. The residual liquor after the removal of the carnallite is

almost six times as rich in bromine as the residual brines from the production of potash in Germany, therefore, Dead Sea brine s the richest known source of bromine and, as a by-product from he production of potash, the manufacture of bromine is carried out readily and cheaply.

During the first year of operation 13,000 tons of crude potash

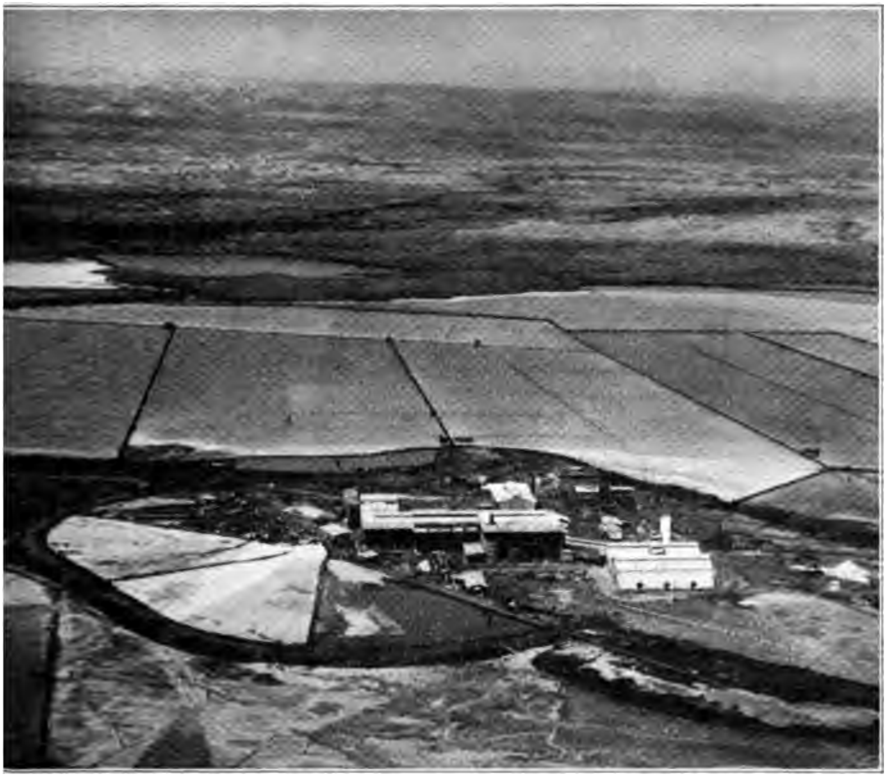

Fig. 3. Refinery of the Palestine potash works. Courtesy, American Colony

alts (carnallite) were harvested. Two bromine plants are successully operating at the Dead Sea. The first was completed in 1931 nd has a production capacity of more than one ton of refined romine daily. The second plant, erected in 1932, has a production apacity double that of the first. The products produced are of ood quality and find a ready sale in the world markets.

Other Products of the Brine

The plants for extraction of potash and bromine from Dead Sea brine are yet in their infancy but while established primarily for the purpose of securing the aforementioned products, oth materials will be taken from the waters·as markets for them aris After the extraction of the potash and the bromine, the final bri contains the chlorides of magnesium and calcium both of whi can be extracted readily by easy methods. Some magnesiu chloride has been produced recently. Because of the absence of iron from the brine, it yields a salt (magnesium chloride) of exceptional purity. Chemical and textile industries are the chief users of magnesium chloride.

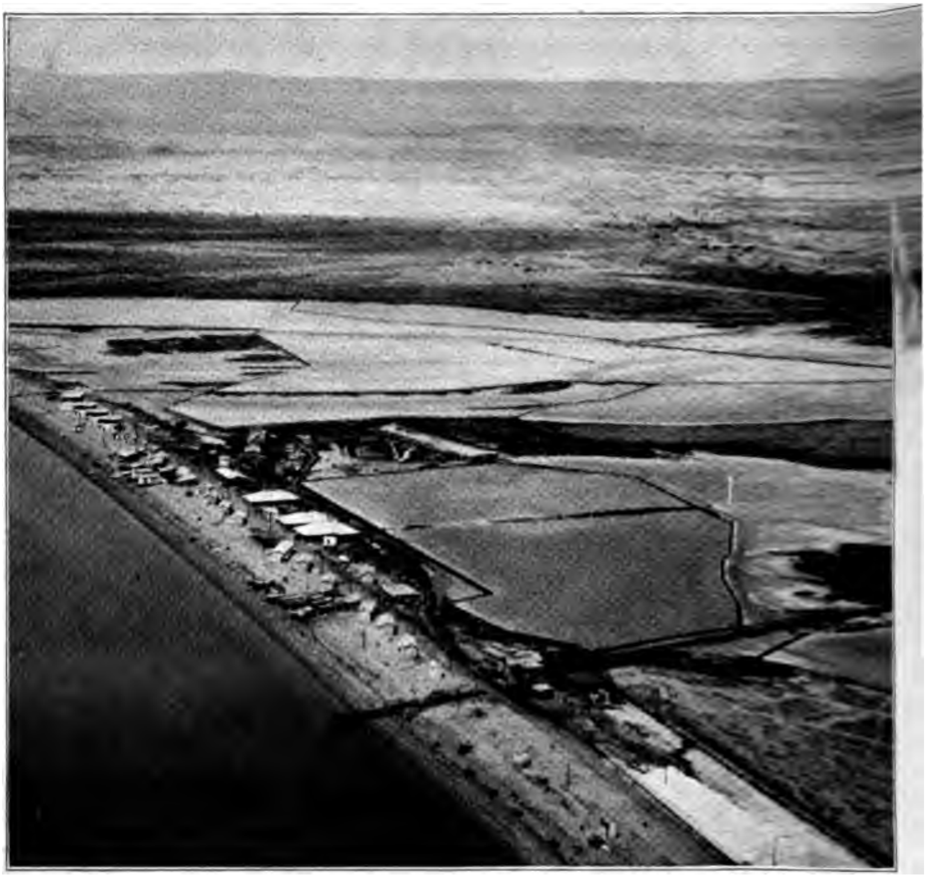

Fig. 4. Evaporating pans and homes of employees at the potash settlement. Courtesy, American Colony

Since more calcium chloride is produced as a by-product of other industries than is needed, removal from brines is not profitable. However should there be a market for this salt, it can be easily extracted from the Dead Sea brine.

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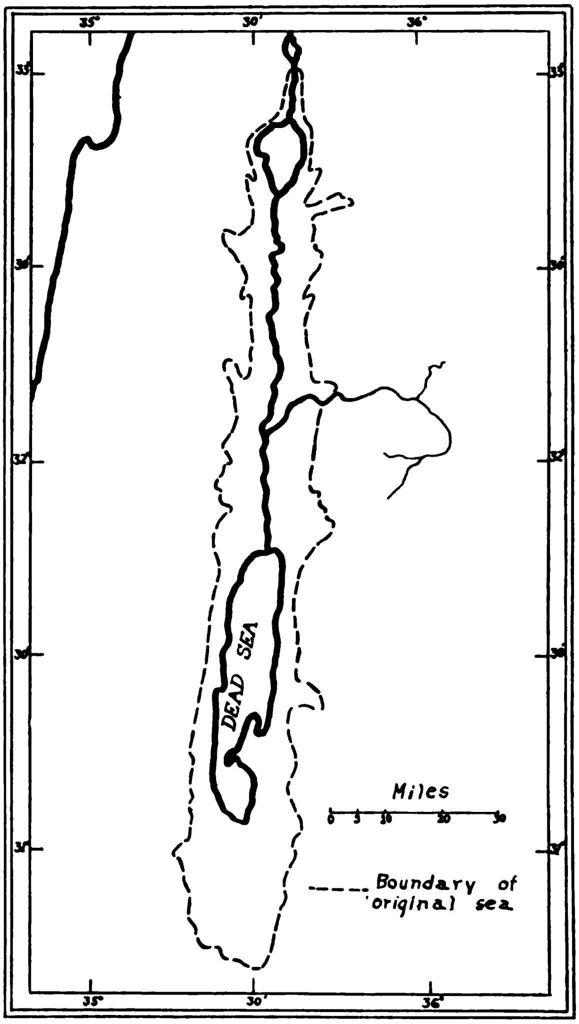

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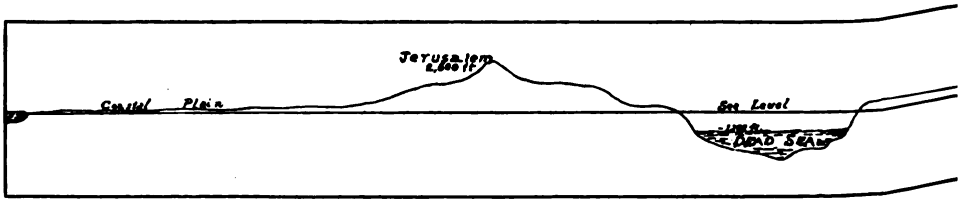

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The original sea was three or more times longer than the present Dead Sea. At its maximum area it extended about thirty miles south of its present limit and northward beyond the Sea of Galilee.

Early Knowledge of the Dead Sea

The unusual nature of the Dead Sea has long been known. About 65 B.C., the Greek geographer Strabo wrote of his impressions of the destructive-to-life sea. Apparently no organized attempt was made to survey this body of water until 1835 when an unsuccessful expedition was led by Castigan, an Irishman. Following this British, French, American, and German societies undertook scientific explorations for the study of the origin and peculiarities of the sea. No study of the feasibility of a commercial use of the minerals dissolved in the waters of the Dead Sea was made until 1911. The result of a prolonged and detailed survey was the establishment of industrial plants for the extraction of the mineral wealth.

Research Work

Due to the shortage of potash during the World War the British Government during 1918-1919, and 1923-1924, undertook researches of the Dead Sea brine.

The analyses, made in the government laboratories, London, of the many samples taken at various depths, show the approximate quantities of salts in the Dead Sea. These when converted into marketable form are materials that the world needs.

Potassium Chloride (KCl)	2,000 million metric tons
Magnesium Bromide ($MgBr_2$)	980 million metric tons
Sodium Chloride ($NaCl$)	11,000 million metric tons
Magnesium Chloride ($MgCl_2$)	22,000 million metric tons
Calcium Chloride ($CaCl_2$)	6,000 million metric tons
Calcium Sulphate ($CaSO_4$)	120 million metric tons

The Jordan and other tributary streams are adding to this supply constantly. It is estimated that 40,000 tons of potash are added annually.

The World's Need of Potash and Bromine

Potash is used in a number of widely different industries as electroplating, photography, medicines, tanning, dyeing, and in the manufacture of soda, glass, matches, and explosives. But its chief use is as a fertilizer for about 92 per cent of the total supply of potash is used in the manufacture of fertilizers, while all the other industries in which it has a part use 8 per cent. Field tests, experience and observation of agriculturists show the necessity for potassium in crop production.

Soils are being depleted of their fertility with alarming rapidity. The continuance of high yields of crops—in fact the yield of any crop produced with profit—is dependent upon the restoration and the continuance of the fertility of crop lands. Abundant life will not spring from the soil unless certain materials be present. Some of these are found in but few parts of the earth, the least widely distributed being potassium which is so essential to the growth of plants. Of the average total content of commercial fertilizer 3.[illegible] per cent is potash.

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POTASH AND BROMINE FACTORIES

In 1931 factories for the extraction of potash and bromine began operations. The extracting plants are peculiarly blessed in developing a unique manufacturing process, with climatic conditions which are remarkably favorable. Except for a very brief period during the winter the sky over the Jordan Valley is so nearly cloudless as to maintain solar radiation thruout the year. The maximum temperature in the sun is high, reaching 167° F, therefore, solar evaporation is notable and swift. The evaporation, which amounts to 90 inches a year, is effected in large concentrating pans constructed on the impervious clay flats surrounding the Dead Sea. At present these pans cover an area of about 1,000 acres. The pans are separated by wooden dams filled with earth, and are so arranged as to allow a continual sluggish movement from one pan into another along the gentle slope towards the Dead Sea. They are constantly supplied with brine pumped from a depth of 175 feet below the surface, since at this depth the content of potash and bromine is double that of the surface water.

Rapidity of production could be increased by spraying the brine into the pans and thus hastening evaporation. Common salt is the first deposit in the pans, followed by "carnallite" crude potash, which is decomposed in the refinery and muriate of potash produced. The residual liquor after the removal of the carnallite is

almost six times as rich in bromine as the residual brines from the production of potash in Germany, therefore, Dead Sea brine is the richest known source of bromine and, as a by-product from the production of potash, the manufacture of bromine is carried out readily and cheaply.

During the first year of operation 13,000 tons of crude potash salts (carnallite) were harvested. Two bromine plants are successfully operating at the Dead Sea. The first was completed in 1931 and has a production capacity of more than one ton of refined bromine daily. The second plant, erected in 1932, has a production capacity double that of the first. The products produced are of good quality and find a ready sale in the world markets.

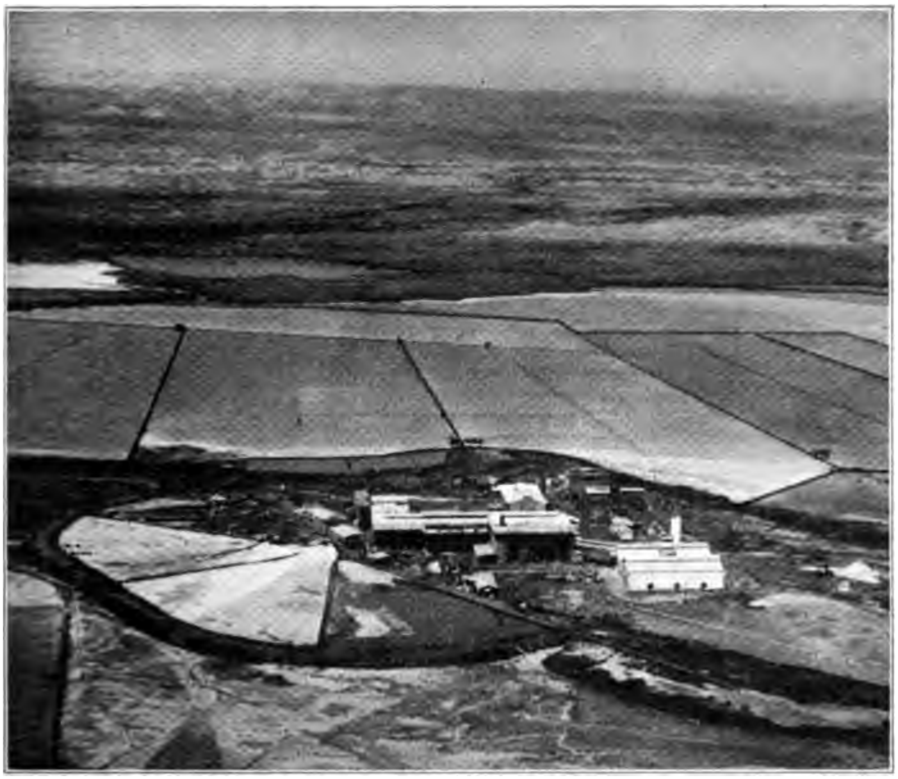

Fig. 3. Refinery of the Palestine potash works. Courtesy, American Colony

Other Products of the Brine

The plants for extraction of potash and bromine from Dead Sea brine are yet in their infancy but while established primarily for the purpose of securing the aforementioned products, othe materials will be taken from the waters as markets for them arise. After the extraction of the potash and the bromine, the final brine contains the chlorides of magnesium and calcium both of which can be extracted readily by easy methods. Some magnesium chloride has been produced recently. Because of the absence of iron from the brine, it yields a salt (magnesium chloride) of exceptional purity. Chemical and textile industries are the chief users of magnesium chloride.

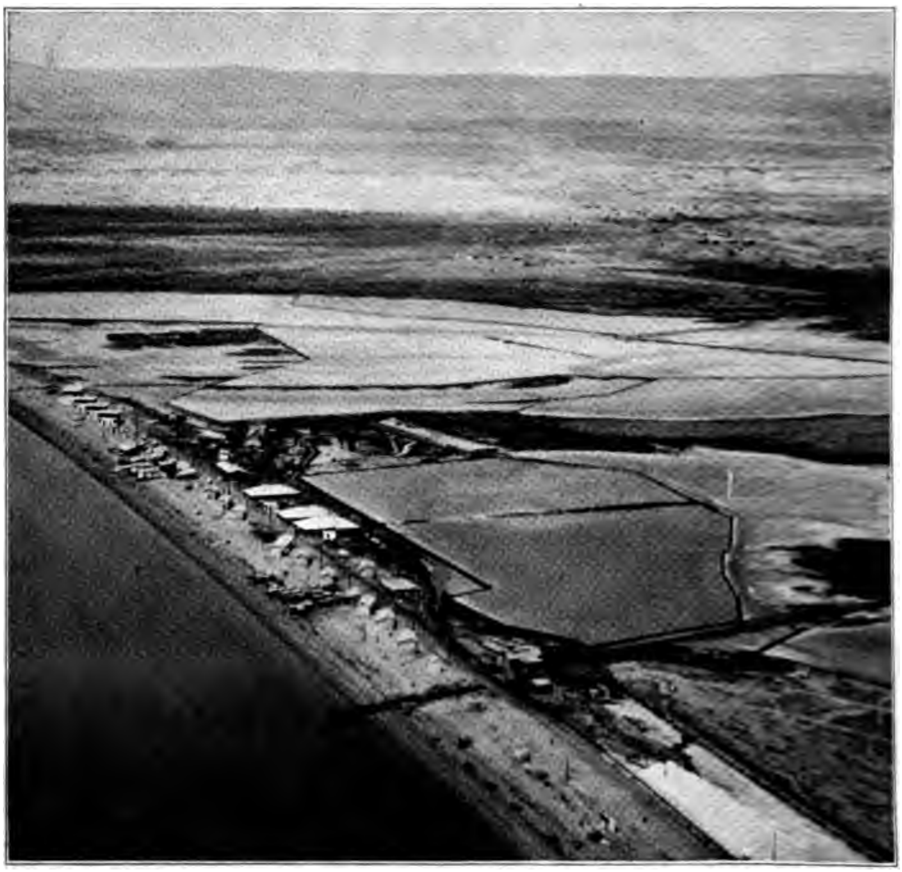

Fig. 4. Evaporating pans and homes of employees at the potash settlement. Courtesy, American Colony

Since more calcium chloride is produced as a by-product of other industries than is needed, removal from brines is not profitable. However should there be a market for this salt, it can be easily extracted from the Dead Sea brine.

The Dead Sea bitumen is jet black in color, possesses a strong smell of crude petroleum (locally it is called stinkstone) and is practically free from impurities. As the production of bitumen from the Dead Sea and the surrounding area is small (not over 100 tons a year) its commercial importance is not great. It is used for carving souvenirs, as an ingredient in molding compositions, and may serve for making varnish and insulating cables.

SULPHUR

In the region of the Dead Sea, sulphur occurs chiefly as a decomposition product of gypsum; therefore, while it is very widely distributed its occurrence is so scarce that it is of little economic value but the Bedouins do collect it for medicinal use.

AN INLAND WATERWAY

The Dead Sea furnishes limited navigation. Considerable wheat is imported from Moab of Transjordan. During the World War the Turks found they could shorten the route to Jerusalem some days by shipping the wheat by boat across the Dead Sea. An organized company is developing inland shipping. A few small sailing boats and motor boats transport passengers from shore to shore.

LIVING QUARTERS FOR WORKMEN

The extraction of minerals from the Dead Sea is so recent an undertaking that the facilities for comfortably caring for the employees are not yet all that is desired. Some of the workmen live in mere huts but the majority are housed in desirable permanent concrete buildings. For the unmarried workers excellent meals are served in the commons at a reasonable rate. A reading room, library, and bathing accommodations with fresh water showers are maintained for the employees. Jerusalem may be reached, over a hard-surfaced road, by regular bus in one hour.

Despite the high temperatures, the prevailing breeze and the relief from perspiration by the rapid skin evaporation, insure labor conditions sufficiently comfortable for efficient results. Water from the Jordan is purified and provided for drinking and domestic purposes.

CAPITAL AND LABOR

The capital of the company as established for extracting minerals from the Dead Sea was $2,000,000. It is interesting to te that the shareholders include members of the three communi-s of Palestine Jews, Arabs, and British.

In 1935 the capital stock of the company was increased by 04,000, a large part of this to be used for the erection of a factory the southern end of the Dead Sea.

A fact, worthy of note and a source of great satisfaction to all ncerned, is that in these factories Arab and Jewish laborers work xt to each other in perfect accord.

TRANSPORTATION AND MARKETS

The development of the export business is handicapped in two ays: difficult and costly transport and inferior port facilities hich require much handling and a lighterage form of loading. At esent the salts manufactured from Dead Sea brine are carried e twenty-six miles to Jerusalem by auto trucks on a first class ad, and from Jerusalem by rail to Haifa or Port Said. Transpor-tion from the factories on the Dead Sea to Jerusalem has a eat drawback in the climb from —1280 feet to +2500 feet.

The products of the potash and brine factories are of good ality and find a ready sale in the world markets. The soap and her local industries use considerable of the products. Practically l the bromine produced is sold in England. Potash from Palestine as a far flung market, 924 tons going to the United States in 1934.

CONCLUSIONS

Many times statements similar to the following have been made: The Dead Sea gives out nothing—always receiving but not shar-g—hence abhorred by man and beast." Science and industry dis-rove such statements. The Dead Sea is a life-giving sea. It pro-ides minerals essential to the life of agriculture and industry. Of ome of these (e.g. potash) it can supply the needs of the world or centuries at the present rate (2,000,000 tons annually) of con-umption. Its waters provide a channel for commerce relieving long dious caravan transportation.

The Dead Sea will provide new life in the economic rehabilitation f Palestine for the exportation of the minerals extracted from the ead Sea will materially aid in the overcoming of the present large nfavorable balance of trade.

ALASKA-YUKON: UNIQUE ADJUSTMENTS, YET UNSUNG

C. CLIFTON AIRD
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The radio, newspapers, and newsreels frequently feature incidents connected with Point Barrow, Matanuska Valley, Dawson, the Yukon River, and the Yukon Territory. Similar publicity has been given to the gold miners and their exploits, to the fabulous salmon catch and the canneries, to perilous trips with dog teams, Yukon steamers, and airplanes.

There are, however, always a number of incidents connected with the human occupancy of the Alaska-Yukon that gets little or no publicity. Some of these are recounted in this article as they were observed by the author in the summer of 1936.

GASOLINE AND THE UBIQUITOUS CAN

Significant as the Yukon is to the Interior during the four busy summer months when its boat service is coupled with its rail connections to the coast at Skagway and Seward, its closure with ice brings the motor-driven vehicles and dog teams into prominence. The airplane is, therefore, its year-round rival. The servicing of gasoline to the motors is done from five gallon tins, each encased in a wooden container, brought in during the summer while the river is open. These cans filled with California gasoline are wharfed at Skagway and hauled 110 miles over a narrow gauge rail, over the White Pass, to Whitehorse, Yukon Territory. There the cans are transferred onto a shallow flat-bottomed barge which is attached to a steamer and pushed downstream. The cans are distributed at various intervals along the Yukon, usually at the mouth of an easily found tributary stream. There need be no dock, nor sign of habitation, just a creek and a tree to stay the boat. The valleys serve as paths into the interior, especially in "upper" country where the bluffs are steep and the easiest entrance to the uplands is afforded by the easier gradients of the valley terraces. Since Fairbanks is not on any navigable stream, and is the base and headquarters of the Pacific Alaska Airways, its supply of gas must be trucked 100 miles over the Richardson Highway from Circle on the Yukon, brought in by freight planes, or transferred from the barge to the government owned railroad at Nenana.

The distribution of this gasoline is wider than one might anticipate until one learns that, tho the air lines converge at Fairbanks, their terminal bases are somewhat elastic, and chartered planes may take one to remote locations. Since these locations may not have landing fields the planes are equipped to land on wheels or pontoons, or on skiis, depending on the character of the terrain and the season.

When the gasoline container is empty, adjustments for the ubiquitous can begin. One finds them with the tops removed and wire handles added, serving as water pails for the miner, trapper, woodcutter, and the steamer's cook. Even the residents of Fairbanks, "The Golden Heart of Alaska," may buy water delivered in these cans. If the water is carried far, a shoulder yoke may be used. A thin board about the size of the can opening floats as a cover to prevent spilling, as the bearer trudges along a rough path or over a rotting elevated sidewalk.

Other cans are cut open and made flat. These pieces are used for patching sleds, houses, boats, or even strengthening airplane skii. Other strips are wrapped around the supporting posts of the elevated log caches. These strips make it impossible for small climbing animals to reach such supplies as the stored winter foods, skins, and leather harnesses. A road-house at Yukon Crossing (on the Winter Road and Yukon River) is shingled with such flat pieces, reminding one of Mrs. Wiggs—and there is a garden patch! A flat strip of the can may be inserted into a slit in a stove-pipe in a summer tent-house to serve as a fire-regulator or damper.

For other uses the top of the can is left intact, but one of the larger sides is removed, or partly removed, and the rest turned back to give extra support. This may serve as a dish-pan, a pan for cooking cereals for man or dog, or for a laundry tub. The other laundry equipment is often a home-made wooden-handled plunger made of a large can that probably contained condensed milk. In this can holes are cut to permit the free circulation of air and water. Any day is washday in this region of men.

COLD WINTERS AND FROZEN SUBSOIL

The individual gold digger in the Interior exploits only the upper three to six feet of mantle rock which thaws out in summer. Below that the ground is always frozen. Gold deposits below the frozen subsoil can, therefore, be reached only by the operation of big dredge companies which thaw the ground preparatory to the operation of the dredges. Since the thawing is a slow process, each company has one or more dredges working in one location while another area is being thawed preparatory to next summer's dredging. Originally steam was used, but even with cold water deeper thawing is done in one summer than the next winter can re-freeze.

Since bed rock is not readily accessible below this frozen subsoil, building materials for the larger structures are not of stone but of reinforced concrete or wood. The foundations rest on frozen ground, which is reached below the surface material that has been "stripped" after a thaw. Ground fires of brushwood hasten the stripping. The four story Federal Building at Fairbanks built a few years ago shows that no serious settling has taken place on this frozen foundation. When the buildings are of logs or sawn timber the fire hazard is enhanced by this frozen subsoil. In Fairbanks the water mains are kept empty until the fire alarm sounds. The hydrants, placed only in the business block, are enclosed in insulated wooden boxes to prevent freezing. To the casual observer they suggest the red tool boxes used by our street departments. The frozen subsoil is a further hindrance in getting an underground flow of water, and consequently, wells are few.

All buildings, whether log cabin, school, hospital, or hotel have an opening for ventilation near the ceiling of each room. The opening reminds one of a hole for a stove pipe or a hot air register. The opening may be screened, slatted, or left open. Some are adjustable, others are opened or closed with a rag or cloth. These ventilators are a direct adjustment to the extreme winter's cold. Without them, when the room temperature is 65° F. or more, and the outside registers a low subzero temperature, the hotter air near the ceiling causes the ceiling to "sweat" and the room is damp, uncomfortable, and unhealthful. With the ventilator the greatest heat escapes and the room does not sweat. Rime festoons the outer opening, taking on added size and beauty as the winter advances.

Another adjustment reflected in the construction of buildings is the entry, noticed especially in public buildings. The entry-room is a step or two lower than the main floor. It is wide enough so that the outside door is closed before the inner door is reached. Thus, the cold air, being heavier, is trapped as in a well, and drafts on the floors are eliminated. Much of the cold air within the homes is due to lack of insulation beneath the cabin floor.

SUMMER PROBLEMS

Dog teams are of no use in the summer and may, in fact, be a nuisance. If the trapper (the miner rarely has a team) goes "out," or to the trading post on the river, or turns to fishing or working for a mining company (which is less likely) his team is a handicap to him. If turned loose, the dogs would run wild and be a loss. So certain individuals have made a business of "boarding" dogs for the summer. The boarding places are usually near a settlement or along the Yukon where transportation by water brings the dogs with the first boat, and takes them back to their owner with the last boat of the season. Only the dogs of the white settlers are sent to "board," as the Eskimo and Indian settlements (or villages) care for their own teams. Each dog is tied alone, as even the best of team-mates fight. The dogs need shelter from the glaring sun and plenty of water. Boxes or bushy willows supply the former; a slough, river, or pump near a stream, the latter. A long chain with both ends snapped in the dog's collar goes around a stake or post. The post and chain length mark the summer's world for the dog. Dried fish or smoked caribou are the diet, with gruel and cooked scraps as the winter working season approaches.

As the days of summer lengthen and gardens are planted, provision must be made to keep the seeds from rotting in the cold wet soil. So in order to utilize the heat of solar radiation, the seeds are barely covered with earth. As the seeds germinate, more soil is hilled around the plants, while trenches around each garden-bed provide the necessary drainage from the bog below. Many of the greenhouses, reflecting the orgy of spending in the gold rush days, and the need for fresh vegetables, may be dilapidated but they produce lettuce, radishes, and tomatoes, which pay better returns than cut flowers. In lieu of the latter, paper flowers may have to suffice in the decorations of the graves, even as painted boards serve as markers.

CONCLUSION

The coast, as well as the interior, furnishes many other interesting examples of how men have used some resources, and ignored or partially overcome many handicaps which would be deemed insurmountable in some more favored spots. Thus, there are the problems of tides at Anchorage, so high and strong that most insurance companies refuse to assume the risk of ocean vessels. Vessels dock at Seward, and provisions are shipped to Anchorage by rail. There is also the flood hazard at Valdez, which has nece sitated the building of levees to protect this settlement from t August floods of nearby glaciers. The ample supply of water fro the gravels of the outwash plain on which Valdez is built and t natural harbor more than compensate for the dangers from flood Ingenious, too, is the platform of planks that serves as two tenn courts erected over a part of the rocky coast where Cordova built. Cracks between the planks facilitate air circulation and drai age and thus help dry out the timbers, while discarded fish nets on a framework of saplings, form the back stops for the courts.

Thus, undaunted, these pioneers play and work. It is not all makeshift and for the present, as some planning for the future is evidenced in some of their constructive measures for salmon conservation and in their plant and animal breeding experimentation at the Alaska Agricultural College. Their philosophy of life is tuned to the rigors these few widely scattered people have to meet. It sustains them until death. Nowhere is this philosophy better illustrated than in the territorial home for aged men in Sitka. The building is near the sea. The rooms of the sailors and fishermen look out toward the sea; those of the prospectors face the hills. One looks in; the other, out.

OFF THE BEATEN PATH TO CHIHUAHUA, MEXICO

ALFRED CROFTS
Adams State Teachers College, Alamosa, Colorado

Many travelers over the Golden State Route stop over at El Paso to visit Juarez, across the Rio Grande in Old Mexico. Few penetrate farther south, and almost none reach Chihauhua City, 250 miles south of Juarez, even tho it is capital of the largest state in Mexico and metropolis at one time of the whole New Spain area. This is largely due to the fact that passenger trains, both to and from Mexico City on the National Railways, reach Chihuahua at midnight, a time when the tourist is unlikely to gather any definite impressions of the city, and due also to the lack of a highway for motorists. Now a motor road is ''under construction'' parallel to the rails. For eighty-five miles there is gravel surface, then follow one hundred miles that are barely surveyed, and the last seventy-five miles are in fair condition, but south of Chihauhua City there is almost no road at all. For perhaps a decade to come traffic for Mexico City will be routed over the Pan-American Highway. However, road crews are stationed along the unfinished portions of the Juarez-Chihuahua route; and the work goes on slowly, and embankments may be washed away before bridges and culverts have been constructed. Politics are probably behind the delays and inefficiency of the contractors.[1] Even thus, Chihuahua can be reached by motor car.

THE ROAD TO CHIHUAHUA CITY

In dry weather the drive is not difficult. I have covered the distance in six hours, but it may take twenty hours or an indefinite time. Repair parts or service cannot be found anywhere along the route. Small downpours make the road into an extended lake, hence, the only regular traffic is in ramshackle busses or by covered wagon. On Fiesta Day last September there was only one American registered car in Chihuahua City.

For a third of the way the road follows an extension of the West Texas plains; all is arid, while sand dunes and lava bluffs are the only landmarks. In a few irrigated areas, excellent cotton grows. For the remainder of the journey the route crosses a higher plateau, perhaps thirty miles wide, rising on the west to the foothills by rail. There is also the flood hazard at Valdez, which has necessitated the building of levees to protect this settlement from the August floods of nearby glaciers. The ample supply of water from the gravels of the outwash plain on which Valdez is built and the natural harbor more than compensate for the dangers from floods. Ingenious, too, is the platform of planks that serves as two tennis courts erected over a part of the rocky coast where Cordova is built. Cracks between the planks facilitate air circulation and drainage and thus help dry out the timbers, while discarded fish nets, on a framework of saplings, form the back stops for the courts.

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[1] The Pan-American Highway was supervised for some time by the treasurer of the National Railways. This fact probably explains why most of the construction was finished one or two years behind schedule.

Thus, undaunted, these pioneers play and work. It is not all makeshift and for the present, as some planning for the future is evidenced in some of their constructive measures for salmon conservation and in their plant and animal breeding experimentation at the Alaska Agricultural College. Their philosophy of life is tuned to the rigors these few widely scattered people have to meet. It sustains them until death. Nowhere is this philosophy better illustrated than in the territorial home for aged men in Sitka. The building is near the sea. The rooms of the sailors and fishermen look out toward the sea; those of the prospectors face the hills. One looks in; the other, out.

of the Sierra Madre Occidentale. This area seems to include some of the finest pasture land in North America, a year-round range with the summer grass two or three feet high. Rainfall is below twenty inches, and the fine condition of the land is probably due to moderate grazing. Indeed, altho run-off is rapid, and the subsoil seems to be mostly gypsum or impermeable clay, there is no sign of the erosion that is converting much of the United States into desert. The country seems almost unoccupied: perhaps once in fifteen miles a lateral trail leads to some rancho; the railway stops are merely cattle loading stations; only one windmill is seen, and there are but three fence-lines. Not much attention has been paid to breeding cattle: there are a few black Angus herds but most of the steers are of mixed blood, with strong traces of the old longhorn.

Chihuahua City lies in a low, well-watered basin, surrounded by higher summits, a site like that of Monterrey, N.L. While it serves a huge ranching area, it grew up two and a half centuries ago as a mining town. The Santo Domingo and Santa Eulalia mines, southeast of the city, have produced fabulous wealth and are still far from exhaustion. The American Smelting and Refining Co.'s smelter, largest in the world, had an output in 1934 averaging 10,000 tons of refined lead alone a month. Its staff of engineers and thousands of workmen live in a company suburb, ineptly named Avalon, five miles below the city. A small tax on the Santa Eulalia mine built the huge Cathedral of San Francisco, completed in 1789, and perhaps the finest in northern Mexico. Today American capital, controlling the Chihuahua mines, those at "Cusi" (Cusihuirachic), and others in the high Sierra, supplies much of the state revenues.

MODERN CONDITIONS IN OLD MEXICO

The city itself is truly a part of Mexico. It does not, like Juarez, hold out constant bait for the tourist. In fact, native art work is hard to find, and hotel accommodations are limited; yet the streets are cleaner than these in the Federal Capital, and excellently paved. Fine public buildings surround the two plazas, and there are thirty schools including the new Instituto Cientifico y Literario. The revolutionary government's program of universal education is far under way. At the same time, religious education is forbidden and religion itself so weakened that I do not remember seeing a young person in the cathedral.

There are two large public markets and many blocks of stores.

In the latter, almost all types of standard merchandise are for sale. There are agencies for Ford, General Motors, and Studebaker. Tires, high-grade hardware, most precision machinery, and pharmaceutical goods such as cattle serums, are imported from the United States. The camera and film market is being lost to the Germans, and there are English textiles for sale, along with German cut glass and Czechoslovakian pencils. To an amazing extent, however, Mexico has become industrially independent. Domestic paper goods, ready-to-wear clothes, shoes of all grades, and canned foods have forced out imported brands. American residents until recently smoked American cigarettes but, today, they invariably prefer Mexican cigarettes that are comparable in flavor and cost one-fifth as much. The Hollywood film monopoly has been broken, tho such box-office stars as Gable, Astaire, and Crawford will usually fill a theater. During September, 1936, a Gaumont-British, a German, a French, and several Mexican productions appeared at the principal show-house. Among the Mexican pieces was a musical comedy, a version of Dracula, and a frankly propagandist Workers' film, Lo Minimo Del Salario. Photography, direction, and acting are imitative and inferior, yet the innate artistic ability of the Mexican people will no doubt help them to create, in time, standards of their own in the theater.

CHIHUAHUA AND NEW MEXICO

The State of Chihuahua, with 95,000 square miles and a total population of half a million, supports five persons to the square mile, as against three in New Mexico. Chihuahua City, with 50,000 people, is twice as large as Albuquerque; and the ranking cities of Juarez, Jimenez, and Parral are larger respectively than Roswell, Santa Fe, and Las Vegas. The states of Chihuahua and New Mexico are closely comparable: contiguous for 150 miles, they are similarly intersected by the continental divide and drained by the Rio Grande. Chihuahua City (elevation 4400 feet) has about the altitude of Albuquerque. Each state is dependent upon livestock-raising and mining, and each shares the Spanish historical tradition. New Mexico in 1934 supported 1,225,000 cattle and 2,750,000 sheep, two and a half times as many cattle and twenty-five times as many sheep as Chihuahua. These figures indicate how American ranchmen have forced their range, and why pasturage is still luxuriant south of the Rio Grande. Mining tells a different story. New Mexico's 1929 mineral output of $30,000,000 was only two-thirds of

Chihuahua's.[2] Yet the Mexican state levied taxes in 1934 of $750,000, less than enough to support the state university at Albuquerque, and only one-twentieth of New Mexico's assessment.[3] Small wonder that the government of Mexico emphasizes low taxation in trying to lure American capital across the border!

MEXICAN VS. AMERICAN STANDARDS

Comparison of the two principal cities furnishes an interesting study of living standards. The city of Chihuahua has perhaps a tenth as many telephone subscribers; it is without a department store, an elevator, or a tall building; its principal structures, dating to the time of Diaz are heavy, low, and recessed, adorned with gargoyles and wrought iron. Chihuahua has relatively one-fifth as many automobiles, one-half as many doctors as Albuquerque; its primary teachers receive twenty-one American dollars a month; its workmen's daily wage would buy them but three gallons of gasoline or four tickets to the moving pictures. A new Chevrolet would cost five years' income. Thus, the Mexican citizen would seem to have attained about half the American's standard of living.

On the other hand, Albuquerque has no opera house nor marble casino; it publishes fewer newspapers, if better ones; its residences are far more up-to-date than Chihuahua's, tho it can show nothing equal to the splendor of the Terrazas estates. It is also less self sustained. Chihuahua, with a large brewery, railway shops, two clothing and one shoe factory, as well as thirteen other assorted small industries, has merely begun to supply the local market. Unemployment is rare. Deposits in the Banco Comercial increased from one million pesos to two and a half million in the year 1935. Prices of wool and meat in Chihuahua are high tho production costs are ridiculously low; an acre of fine grassland may be bought for about the price of two pounds of beef on the hoof. A young American graduate would find the opportunities in Chihuahua brighter than those at home, but, unfortunately, the Mexican government issues no new passports to foreigners for more than three months' residence.

A CENTER OF HISTORICAL INTEREST

The climate of Chihuahua City is more temperate than that of

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[2] Giving the peso its old value of 50¢.

[3] Valuing the peso at 28¢, the present figure. It should be added that the Federal Government in Mexico contributes heavily to state education.

El Paso, yet almost never cold. The continental divide, with some of the finest scenery in the Rocky Mountain region, is but forty miles away. There is more of historical note here than anywhere else in the Rio Grande basin. In colonial days Chihuahua was the great outpost of Spanish civilization on the Comanche-ridden plains. As the political center of the North, it has fomented every revolution against the central government of Mexico. Here Hidalgo, father of the independence movement, was captured in 1810. His prison cell has been incorporated into the new Federal Palace, and a huge monument in the center of the main plaza marks where he was shot. Benito Juarez made Chihuahua his capital in 1864. Diaz settled large colonies of American Mennonites and Mormons along the Conchos River. He also granted six million acres of northern Chihuahua State to his friend Don Luis Terrazas, who became cattle king of the world and one of the most vivid and powerful aristocrats of all time. A peon child, born not far from the Terrazas estates, grew up to destroy the feudal system in Mexico; twenty years after the revolution, ruined haciendas and crumbling mansions recall the raids of Pancho Villa. Hoping to set up his own dynasty, Villa began a fifty-room palace, never completed, in Chihuahua City, and built a splendid mausoleum which he was destined never to occupy. As late as 1929 the Escobar revolt, designed to bring about the independence of the North, centered in Chihuahua. The city's past is, thus, full of unrecorded drama. Its future seems brilliant. The American visitor finds a ready welcome and a rich experience.

INTEREST-STIMULATING DEVICE

An Experiment in Map Making in a Junior High School

The value of map making by graded school pupils has long been recognized in the Milwaukee school system.

The past year Steuben Junior High School undertook an experiment in the making of maps in the geography classes. It was an experiment to see whether the influence of the many other activities of the school would off-set previous interest in map making in the grade schools. It was also a challenge to see whether enough interest and activity could be aroused so that geography classes would be more than formal reading and recitation. With the knowledge that the former grade pupils were in a new environment, that the pupils were more mature, and that there were twenty-six different kinds of club activities in the school, all of which had strong drawing power, the map making experiment was begun.

I chose my 8A geography class because it was comprised of a heterogeneous group, which included pupils of low and high I.Q. ratings, thereby being a cross section of representative students.

The question of map making was put up to the pupils with the remark also that 99 per cent of the work would necessarily have to be done after school, before school, and during the noon hour. The response was highly gratifying, there were many more volunteers than we could use at any one time. Paint brushes, show card paints, and cardboard 21 by 27 inches were supplied. A lantern was used to project the maps chosen for enlargement.

It was interesting to note that pupils who were lax in class room discussion were among the first to volunteer their services. These students took a more active part in class discussion as a result of their participation in map making.

The results of this successful map making experiment in a junior high school, may be summarized as follows:

1. The class became very conscious of the different types of boundary lines.
2. The maps served as a class project and the pupils were proud of them.
3. Other geography classes became interested and started to make maps of their own volition.
4. Interest was keen, since the work was done in spite of the other attractions of twenty-six club activities.
5. Without exception the pupils always stayed longer to complete the map work.
6. The class enjoyed motivation and actual use of their own maps.
7. The procedure of map making was explained to other pupils, in other rooms, their own request.

I am personally convinced that any activity that will arouse interest and stimulate enthusiasm in a subject is worthwhile to the pupils as well as to the teacher.

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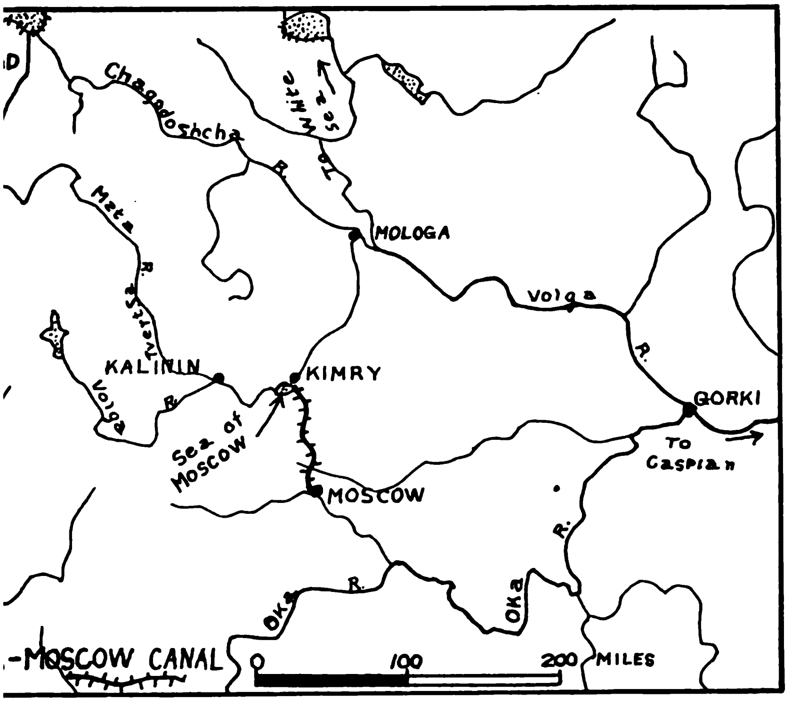
EDITORIAL NOTES AND NEWS

companying sketch map shows the location of the new Volga-Moscow canal ɔeen opened to traffic recently. The canal extends from the town of Kimry, ga, to Moscow and is 79 miles long. The difference in water level of 163 feet me by the construction of 11 locks. The work was done in five years and ıe erection of 4,077,000 cubic yards of concrete work and the removal of cubic yards of earth material. It is now open to ships not exceeding 18,000



cement and 4.5 meters draught. The canal reduces the navigable waterway [oscow and Leningrad by 680 miles, and that between Moscow and Gorki ovgorod) by 68 miles. At the entrance of the canal near Kimry a large ıs been created which is 126 miles in circumference. This reservoir has been "Sea of Moscow." This basin was formerly occupied by the town of Korcheva, nearly a thousand years old, as well as four villages and 4,500 farms. The scow makes it possible for large river boats to navigate the upper portion ;a as far as Kalinin (Tver).

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eographical records are being made frequently these days, especially by the ıe airplane trips from Soviet Russia to the United States have attracted great Second in interest is the party that will spend the winter at the North Pole. ., the party landed on an ice floe about 12 miles from the North Pole. After ; a camp for the four scientists who are to remain, the airplanes returned to y June 21, the ice floe had drifted to approximately Lat. 80° 10′, Long. 0°. At f writing, this is the last report available. Communication with the polar camp is being maintained by wireless. The ice floe appears to be traveling at approximately four miles a day. It covered a distance of about eighty miles in a southeasterly direction and then drifted towards the east. While present information is inadequate proof, this shift in direction appears to confirm the theory of a circular polar current in the polar basin.

Other interesting data have already been collected. An ocean depth of 14,350 feet has been measured. This measurement was taken on June 20. Temperature data are also very interesting. Beneath the top layer of water and down to a depth of 760 feet a temperature of 28.75°F. was found; between 760 and 1,830 feet was a layer of relatively warm water, having a temperature at 1,220 feet of 33.7°F. Below 2,285 feet the temperature falls gradually to 30.4°F. at a depth of 8,930 feet. The thermometers were unable to stand the pressure at the bottom of the ocean and hence no official records were obtained as the instruments were broken.

Dr. J. W. Hoover reports that, beginning this year the city of Phoenix, Arizona, is expanding the geography course to include the eighth grade. The state course does not call for geography beyond the seventh grade. The expansion of subject matter will affect particularly the fifth grade, and the program is pushed upward to include the first semester of the eighth grade. In the second semester of the eighth grade, the geography of Arizona will be studied in correlation with Arizona history. The other school systems of Maricopa County are generally falling in line with the Phoenix plan and we believe the rest of the state will follow suit. Maricopa County includes about one-third of the population and schools of the state. The Arizona branch of the National Council of Geography Teachers has been active and an important factor in bringing about this expansion of the geography course in which geography will replace General Science and Spanish.

Dr. Eugene Van Cleef, Ohio State University, was recently honored by the President of the Republic of Finland with the Cross of Knight I Class of the White Rose of Finland, together with a diploma pertaining to the decoration. This honor was granted in recognition of Dr. Van Cleef's research and publications dealing with the geography of Finland and the settlement of Finns in the United States. The decoration bears a Maltese Cross with the White Rose of Finland in the center, and the Finnish Coat of Arms in gold tracery between the arms of the cross.

The Nebraska State Council of Geography Teachers, together with the Nebraska Academy of Sciences, sponsored in May three half day sessions with programs devoted to geography and related subjects. A tea and luncheon were other features of the meetings.

Dr. J. W. Coulter of the University of Hawaii left June 25 for a three months' study of land utilization for Pago Pago in American Samoa. He will then visit British Samoa and Fiji and outlying islands, and then continue his land utilization studies in New Zealand. Following a series of lectures at the University of Sydney he will proceed to Papua, Netherlands Indies, Singapore, India, Netherlands, England and Ireland. He will return to Hawaii in September by way of the United States.

Dr. George D. Hubbard, Emeritus Professor of Geography and Geology of Oberlin College, taught during the past summer at Harvard. At the close of the summer session he sailed for China where he will teach for a year or more in Yen Ching University in Peiping.

ANNUAL MEETING
OF THE
NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

The annual meeting of the National Council will be held at the University of Michigan, Ann Arbor, on December 27 and 28. Professor James of the Department of Geography has assured us that accommodations for visiting geographers will be provided at the Michigan Union on the University campus.

A considerable portion of the program will center around Researches Needed in the Teaching of Geography. The various fields of instruction including college, secondary, and elementary levels will be represented on the program.

It is hoped that everyone interested in the improvement of geography teaching will participate in outlining a program of research that the National Council can successfully sponsor. Research in the teaching of geography is an essential part of progress. You are urged to help make this a notable year in the history of the National Council. Your presence and participation in the deliberations of the organization are earnestly solicited. See additional particulars in the October issue of the JOURNAL.

EARL E. LACKEY, *President*

GEOGRAPHICAL PUBLICATIONS

The Future of the Great Plains. Report of the Great Plains Committee. 194 pp., ills., maps, graphs, tables. Washington, Dec. 1936. Price 40 cents.

Because for more than half a century settlers have been trying to farm the Great Plains as they were brought up to treat the more humid areas in the East, our Government is today faced with the problem of undoing, in part at least, the work of hundreds of thousands of farmers. It was to study the present situation and to propose means for making the best use of the region that in the summer of 1936 the President appointed the Great Plains Committee.

In drawing up its report, the Committee has included an excellent summary of the physical background of the problems now facing the Great Plains farmers. Climatic variability is stressed thruout because, had it not been for occasional years of abundant rainfall, the region would presumably long ago have been abandoned except for grazing. The discussion of physical characteristics is followed by a section on "Use and Misuse of Land and Waters," emphasizing particularly the effects of misuse. Part III, "Program of Readjustment and Development," contains some sane suggestions and thought-provoking ideas for Great Plains people. A long series of appendices includes examples of what has been done in small experimental areas in the region and summaries of pertinent legislation which has been enacted in some states. Essentially, the question of what to do with the Great Plains lies in the land and water as used and misused by man.

This report should be of special interest and value to teachers of rural pupils in the Great Plains, most of whom, presumably, will in later years attempt to make a living in the region. Any alert teacher will find "The Future of the Great Plains" full of stimulating material for project work and class discussion. For the younger classes there is the background question of why their fathers are having such a hard time getting a fair crop of wheat, or keeping the soil from blowing away, or finding enough water for thirsty livestock. For the older pupils there is the problem of what to do about it—and a few of them might be stimulated to try out the suggestions and follow examples given in the report.

JOHN KERR ROSE

Washington, D.C.

W. R. McConnell. **Living in Different Lands, Living in the Americas, Living Across the Sea, and The United States in the Modern World.** Rand McNally and Company, 1935.

This series of elementary textbooks is both simple and interesting. The books are attractive from the standpoint of pictures and print and, in my judgment, are written at the grade level for which they are intended.

The first book of the series, *Living in Different Lands* presents the material for fourth grade in what I consider the most logical order. The relationship idea is used thruout the book without, in the least, seeming to be forced. It contains one hundred ninety-three pictures, about thirty maps and several diagrams.

Living in the Americas, the second book of the series, begins the study of the United States with the New England section. This section is considered the most complex area of our country. However, McConnell's method of handling the material in this order appears to work out a sequence which is understandable for fifth grade children. The book is well illustrated containing two hundred forty-five pictures, fou diagrams, and ninety-two maps besides a number of outline maps. It seems to me t

d States receives excellent treatment at the expense or sacrifice of South
n this book. I regret that the author did not place South America at fourth
ulty.

Across the Seas contains two hundred twenty-seven pictures and about one
ifty maps, grafs, and diagrams. The continents presented in this book are
frica and Australia in the order named.

three hundred pages are devoted to Eurasia, divided into nineteen units of
ica one unit, thirty pages in length; and Australia one unit, sixteen pages in
e tests and exercises given at the close of the units are helpful. It would
the treatment of Africa at fourth level should be given more space.

evaluation, the author may be even more highly complimented on the
k of the series, *The United States in the Modern World* than on any of the
e organization has eight big units of work, for each a preview is given. Many
ht-provoking questions are given under the heading "Exercises and Problems."
ook provides material for a world trade review using the United States as
for world trade. More than thirty grafs provide helpful visual aids, together
hundred ninety-five pictures, one hundred thirty-two maps, and forty-one

e proportion of the material in these four books is so presented by the author
ll almost teach itself, and certainly these books will enable a conscientious
do a good piece of geography teaching.

Anna C. Larson

achers College,
oud, Minn.

Houghton Comfort. The Peter and Nancy Travel Series. **Peter**
Nancy in Europe, 212 pp. 1935. 80c; **Peter and Nancy in Africa,**
p. 1935. 85c; **Peter and Nancy in South America,** 256 pp. 1935.
Peter and Nancy in Asia, 286 pp. 1937. 85c. Beckley-Cardy Com-
1632 Indiana Avenue, Chicago, Illinois.

ooks in this series tell many interesting things about people and places
Peter and Nancy, two Minnesota children, who travel with their Uncle Lee,
er representative. The stories are told largely in conversation between the
f characters and between the children and people they meet on their travels.
the conversation that the young reader gets the feeling of actually traveling
hildren and becoming acquainted with the people and places visited Different
avel—by ship, train, automobile, airplane, camel caravan, safari, donkey, and
h—all are made very real for the young reader.

the experiences of the two children, the reader gains some very intimate
nto the lives of the people. The reader goes with the children to teas and to
d sees how people live in their homes in various parts of the world. The
p to break down some unfortunate generalizations which children frequently
their Holland visit the little girl says, "It's as hard to get a sight of wooden
as to see kilts in Scotland." Over and over again the concrete is emphasized.
ays, "It was fun crossing the Arno River and remembering that it was just
ck line in northern Italy on the maps of the geographies." Again in Norway
I don't see how any map-maker could keep track of the islands. There are
, I believe, from islands big enough for farms to mere pieces of rock sticking
the ocean." There are many opportunities to help build up respect and
on for other people. The uncle asks the children the size of their garden plots
Minnesota farm and gives them his reason for asking: "Because I want you
e idea of what the Danes can do. Many of their farms are only an acre and

a half. Forty acres would be considered an immense farm." Again, when Nancy remarks at Calcutta, "The next time I see a gunny sack back home, I'll remember the delta farmer and the work he has to do to grow jute and to strip it." Another example is found in the Argentine pampa where we read "The wagon stood outside the station with three yoke of oxen. The wheels were fully ten feet high and the gaucho explained that they were very satisfactory either when the dust was deep or the road muddy."

The books are attractive and well suited for supplementary reading in intermediate and upper grades. Naturally, in such readers, there are details mentioned that have not high geographic value, but the readers contain much of the kind of material which children can readily enjoy when they bring to the reading a basic understanding gained from their geographic study of the regions concerned.

EDNA E. EISEN

Kent State University
Kent, Ohio

Louise A. Boyd. **Polish Countrysides: Photographs and Narrative.** Special Publication No. 20 of the American Geographical Society, New York, 1937.

Polish Countrysides is an admirable pictorial representation of Poland, particularly of the eastern portions of the country. A total of 495 figures, consisting of 9 maps and 486 excellent photographs, are found in the volume. These are accompanied with a running account of the travels of the authoress in Poland. The trips, in private car, were taken both preceding and following the 1934 meeting of the International Geographical Congress at Warsaw. A wealth of material is provided the regional geographer by both pictures and text. The volume also contains a chapter on rural Poland, contributed by Dr. Stanislaw Gorzuchowski of Warsaw.

The photographs deal principally with rural Poland, and have been grouped both topically and by regional locations. The pictures are excellent, and preserve many scenes of the Poland of 1934 for posterity. The professional geographer will be most interested in many of the fine landscape views, especially those in the hillier southern portion of the country. Pictures of individual peasants and groups of peasants are numerous, and offer a fertile field to the student of dress and of individual types.

The maps of the volume have been selected with reference to the special needs of geographical study, and, in association with the pictures, offer a wealth of basic pictorial material for the student of regional geography.

It is perhaps to be regretted that there are not more pictures of the highly developed area of Polish Silesia, but, as the authoress explains, the omission was due to a camera accident beyond her control. The effect, however, is that the less developed eastern provinces, such as Polesia, are profusely illustrated, whereas the highly developed western regions have but few pictures. This situation, however, is not serious since the avowed intention of the volume is to "illustrate the old rather than the new, the rustic and primitive rather than the urban and cultivated."

LOYAL DURAND, JR.

University of Wisconsin

W. R. Thompson. **Moisture and Farming in South Africa. 256 pp., 34 illustrations.** Agents, Gordon & Gotch Ltd., London. 1936. $2.15

Here is a series of neat summaries of the critical problems of moisture and farming in South Africa, easily understandable to laymen, supplemented by detailed arguments and observed data exhaustive enough to satisfy experts.

Questions such as the effects of grass burning, the degree of soil erosion, changes of climate, and schemes for increasing moisture are among those discussed. All of these have pertinent bearing on problems of our own dry Southwest.

Altogether a first-rate book for anybody interested in the geography of Africa or in conservation of soil and water.

DERWENT WHITTLESEY

Harvard University

Eyler N. Simpson. **The Ejido, Mexico's Way Out.** 849 pages, 40 maps and charts, and other illustrations; an appendix containing 93 tables, a check list of the principal agrarian laws, Article XXVII of the Political Constitution of the United Mexican States, and the Agrarian Code; selected bibliography and index. The University of North Carolina Press, Chapel Hill, 1937. $5.00

The word ejido is used in Mexico to refer to all types of lands which have been restored or granted to agricultural communities under the land reform initiated in 1915. By extension, the word also refers to communities possessing such lands.

The problems involved in the distribution of the Mexican agricultural lands are admirably set forth and analyzed by Eyler N. Simpson in The Ejido, Mexico's Way Out. Mr. Simpson has spent eight years in Mexico representing the Institute of Current World Affairs. He has traveled about the country, mingled with the people, studied their activities, and gained an understanding of their ways of thinking.

The subject material of the book is divided into three parts. Part I explains the origin of the ejido, the struggle for land, the early course of the agrarian reform and its course between 1929 and 1933. Part II analyzes the problems involved in the distribution of the land and the development of the ejido after establishment. Location, topography, quality of the soil, rainfall, and drainage affect the distribution of the land. Political intrigue and legal obstruction are barriers to be surmounted. After the land is definitely distributed the new occupants must be taught better methods of tillage, the effect of fertilization, and methods of combating plant diseases and destructive insect life. The ejidotarios, as the occupants of the ejidos are called, have little in the way of implements or machinery. Such equipment must be furnished them by means of agricultural credit which involves methods of financing. Means of transportation must be provided that the products of the ejidos reach the best markets. Rural schools, hospitals, and instruction in sanitation are a few of the other problems to be faced. The mere giving of the land into the possession of those who work it is but the first of a long series of steps to rehabilitate the rural citizens of Mexico. Part III discusses the future of the ejido, the effects of industrialism, and sets forth the author's plan for stabilizing the process of land distribution and ejido development.

The book represents an enormous amount of work well done. It contains so much material of value to anyone interested in really understanding Mexico, it is difficult to avoid the use of superlatives when referring to this material. The book is tedious reading because Mr. Simpson has endeavored to present every law, every fact, and every statistic that the reader may lack no tool essential in gaining knowledge of the origin, the progress, and the future of land distribution in Mexico.

The author's analyses of some of the ejidos he has studied contain very interesting descriptions of Mexican rural life. Appendix A, with its 93 tables of statistical material, provides useful information concerning conditions in Mexico. The book is illustrated with well-chosen photographs, and forty maps and charts of exceptional clearness.

BEN F. LEMERT

Duke University

NEW PUBLICATIONS

E. M. Rowalt, and Others. **Soil Defense in the Piedmont.** Farmers' Bulletin 1767. 63 pp. Illustrated. U. S. Dept. of Agriculture. Superintendent of Documents, Wash., D.C. 1937. 15 cents

A summary, written in popular style, of the history and cause of erosion in five southeastern states, the extent of the erosion damage, and descriptions and discussions of modern erosion control methods, in coöperative farmers associations as well as federal and state agencies. A major erosion control project for each state has been included because it typifies practices applicable thruout the piedmont section of each state.

Transportation Lines on the Mississippi River System. 1936. Transportation Series No. 4. 124 pp. Illustrated. The Board of Engineers for Rivers and Harbors, War Department, Supt. of Documents, Washington, D.C. 1936. 25 cents

Information regarding all vessels and their operations during 1935.

Michigan Papers in Geography. Vol. VI. Eugene S. McCartney and Robert Burnett Hall, Editors. 444 pp., maps and plates. Illustrated. Department of Geography, University of Michigan, Ann Arbor. 1936. $1.50

Papers read before the Geography Section of the Michigan Academy of Science, Arts and Letters during the 1935 meeting and reprinted from papers of the Michigan Academy of Science, Arts and Letters, Vol. 21, 1935.

Albert Herrmann. **Atlas of China, Historical and Commercial.** 112 pp. Harvard-Yenching Institute. Monograph Series, Vol. 1. Harvard University Press, Cambridge, Mass. 1935. $5.00

Eighty map plates, a selected bibliography, an index of geographical and proper names, and a list of Chinese characters.

J. Stephenson. **The Land of Britain.** Part 78, Berkshire. Historical section by W. G. East. L. Dudley Stamp, Editor. 113 pp. 5 charts. Illustrated. The Land Utilization Survey of Britain, London School of Economics, London. 1936

One set of maps shows geological formations, relief, soils, and climate; another, the use to which the land is put. By interpreting and synthesizing the distributions, certain marked regional contrasts stand out which the author uses as a basis for the delimitation of the county into 25 agriculture regions.

Jerome Namias and others. **An Introduction to the Study of Air Mass Analysis, with an Appendix on Characteristic Properties of North American Air Masses by H. C. Willett.** 84 pp. Illustrated. Third Edition, Enlarged and Revised. The American Meteorological Society. Milton, Mass. July, 1936. 60 cents

E. Markus. **Geographische Kausalitat.** 202 pp. Illustrated. K. Mattiesens Buchdr. Ant.-Ges. Tartu, Estonia. 1936

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THE SOIL CONSERVATION SERVICE AND ITS WORK

HELEN M. STRONG
In Charge, Educational Relations, Soil Conservation Service,
U. S. Department of Agriculture

There probably is in the United States no one natural resource of more significant value to the present and future development of the country than the soil. Soil, with proper utilization, is not used up, and remains as a permanent asset to the nation. Therefore, users of the soil and the nation as a whole, under the coördinated program of the Soil Conservation Service, retain the broad fertile acres covering fairly level and gently sloping crop land, the equal of which, in extent, fertility, climatic conditions favoring use and for accessibility to market demand cannot be found in any other part of the world. This soil has in the past, and may in coming years, render possible an agriculture that can be a lasting foundation for the future welfare of the country, enabling Americans of the future to carry forward under the same high standards of living and of national independence as they have enjoyed in the past.

Without the soil resource of today, agriculture would be curtailed and this progressively would limit the development of every other economic undertaking. Thru the complex interrelationship of modern economic life, agriculture is not a field of activity existing within itself, but it is a basic enterprise the product from which enters into other enterprises such as commerce and manufacturing.

Soil conditions and the soil of today in the United States are far from being what they were when the country first was settled, and when the fields first were plowed and grazed. Agriculture has disturbed the balance between soil removal and soil building developed thru ages by the interrelationship between running water, slope, surface material, vegetation, and climate. According to the 1930 Census, 359,000,000 acres of crop land were harvested, and in 1934, 296,000,000 acres. Altho the total area of the United States is more than 1,900,000,000 acres, more than one-half of this is too high, too dry, too cold, too rough, or too rocky for agriculture under humid conditions. Of the less than one-half the area of the country which, on the whole, has sufficient precipitation, long enough growing season, low enough elevation, and enough soil rather than rocks, for agriculture, there are many localities where untoward physical conditions prevent cultivation. This further cuts down the crop area of the country, and emphasizes the necessity for preserving the soil on our arable acres, and for arresting the processes of soil destruction and soil removal at work in many parts of the country on valley crop lands and upland forested watersheds related to them.

Soil Conservation Service

The work of the Soil Conservation Service of the Department of Agriculture is that of arresting soil erosion by fostering and spreading agricultural practices which will rebuild as well as preserve the soil. Within about 500 demonstration areas in every section of the country, averaging about 25,000 acres each in extent, the Soil Conservation Service is cooperating with the farmers and land owners in the application of a coördinated soil conservation program, based on the principles of good land use.

Because erosion is due not to immediate or single causes, the remedies for it likewise call for a coördination of many different and widely separated physical factors. Thus the Soil Conservation Service has evolved the coördinated program which takes into consideration the many different kinds of land, the varied needs of the individual farmer, and the broad range of conditions from the summit of the watershed to the valley floor. Thru coöperation with individual farmers, in this cördinated program of soil conservation, the Service is *showing* by actual *doing* what can be accomplished in soil conservation. It is stimulating interest well beyond the bounds of its projects, so that sound soil conserving practices now may be seen, even by casual observers, outside the soil conservation demonstration areas. Thru such stimulation of interest, thru leading many to imitate methods that have been of benefit to their neighbors, soil conserving farm practices will spread thru the farm land of the country.

Original Vegetation on Virgin Western Range

When making some field studies recently in the West the contrast thruout wide areas of present day with virgin conditions, came with vivid realization. For example, on a few nearly inaccessible rock shoulders along such valleys as those of the Snake and Columbia rivers, or farther south high up in the mountains along headwater slopes of the Salt River in Arizona, there are thick smooth stands of rich bunchgrass, remnants of what covered all these valley slopes when the first explorers traveled thru these same valleys.

When the Hayden Expedition explored the West in 1870, they found on the Great Plains at the foothills of the Wyoming Mountains, high thick grass such as blue grama, dropseed, and wheatgrass growing well up to the horses' knees. Today this entire area is covered with sagebrush. At other places such as that along Henry's Fork near its junction with the Green River in Daggett County, Utah, high thick grass was growing where today sagebrush is dominant. In many high smooth-floored mountain valleys there was a thick stand of western wheatgrass and of big bluestem. Today these same valley floors are covered with sagebrush, and deep steep-sided forking gullies have destroyed the former smooth valley pastures.

As recently as twenty-four years ago virgin bunchgrass covered the Colville Indian Reservation on the Okanogan Plateau, because, until then the land had been used only for scattered Indian grazing. At that time outside the reservation little but sagebrush was to be seen, and the range was nearly bare. Today all this same area is covered by sagebrush and scarred by erosion.

Soil Conservation Service—Work in the Palouse Hills

The fine deep soil of the Palouse Hills of eastern Washington and adjacent Idaho was covered with a thick stand of native bunchgrass, but wheat cultivation has long since removed this protective soil cover over large areas. After harvesting the wheat, stubble has been burned, then the soil pulverized and left bare for summer fallow. Wind and rain carried away their toll of the fine rich bare soil. Great gullies formed in many places at the base of the slopes, as the water drained down thru drill furrows, in some cases undermining many square yards of land where gophers or other burrowing animals had made their holes.

Winter snow accumulated in great drifts on the many hilltops and hillsides. These great snow piles melted from time to time under every balmy chinook wind, sending veritable freshets over the bare soil, and cutting innumerable gullies into the smooth hillsides (Fig. 1). Enormous quantities of silt have been carried down to the base of the slopes, or spread across highways filling roadside ditches.

After studying this situation, the Soil Conservation Service, in coöperation with the farmer, has returned many of these hilltop fields and gullied lower slopes to grass, cultivating on the contour only the midslopes. Thru this practice much of the water that falls on the slopes is caught in the furrows to be held until it soaks into the ground. Furthermore, farm machinery working on the level instead of straight up and down hill, as formerly, uses less fuel. The larger proportion of fuel was consumed in dragging heavy machinery up and down the hillside fields, so that in cost of cultivation and in yield, the hilltops were the least profitable part of the hills to cultivate. Consequently, when they are taken out of cultivation, put into grass, and grazed land, and, when the farmer plows always

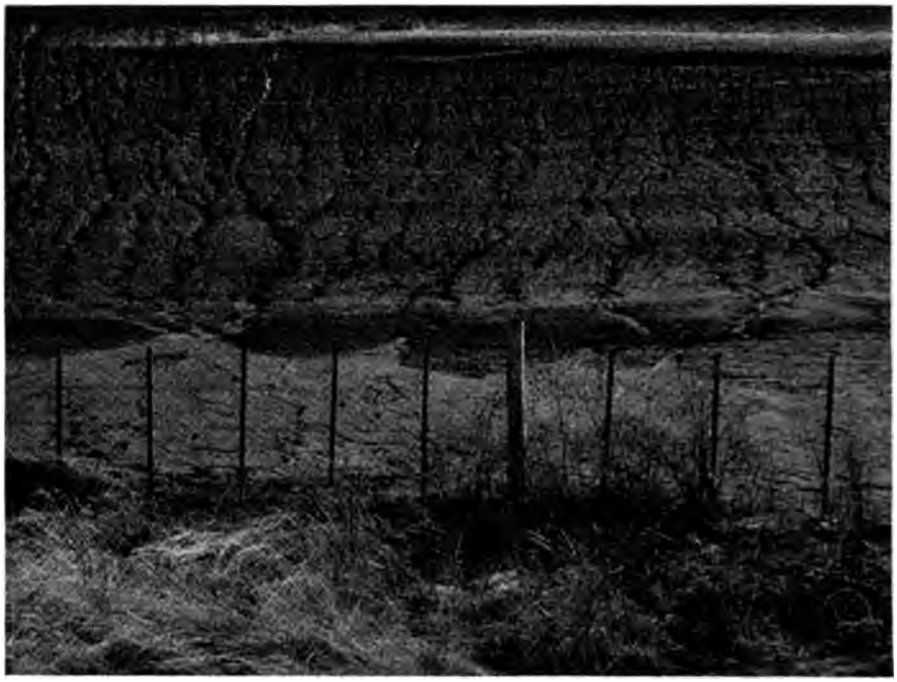

Fig. 1. Water from a hilltop snowbank has melted so as to gully this entire slope on a Palouse hill in Whitman County, Washington. Silt is piled up at the base of the slope. White spots in gullies at the left of the picture reveal places where the gully has cut down thru the top soil to the clay subsoil. Photograph by Soil Conservation Service, March 3, 1936.

snow water, spread it out over the fields, and the native grass is being brought back.

Water is scarce in this John Day country and springs have been few and far between, down in the bottoms of deep valleys. Consequently land around the few water holes has become badly overgrazed. The Soil Conservation Service with the CCC camps assigned to it in this area has hunted out water veins in the valley bottoms, has blasted into these veins, and has covered over the springs thus made so as to protect them from trampling animals. Trees have been cut, hollowed, and laid end to end to be used as water troughs for grazing animals. The Soil Conservation Service with the aid of one CCC camp in this area has opened between forty and fifty such springs among the hills, bringing water onto the range where before there was no water. By realigning fences so as to distribute water holes to the best advantage thru the fields, they have eliminated concentration of cattle around a few water holes and the accompanying concentrated trampling and cutting of cattle trails. Thus with the more even distribution of animals over the range, a less heavy grazing burden is laid upon the grass, and the native vegetation is given a chance to reestablish itself.

THE SOUTHWEST: SILTED RESERVOIRS AND DENUDED RANGES

The natural reservoirs for waters coming into the storage reservoirs and streams of the Southwest are in the forest clad mountain tops of Arizona and New Mexico, and areas immediately to the north. Here among the thick growth of yellow pines, even in October, snow commences to fall and piles up wherever there is a shelter behind which a drift may lodge. As winter advances, snow becomes deeper in the dense growth of yellow pine, and finally roads are blocked so that automobiles cannot travel over them again until spring warmth melts the snow. Ponds form in hollows among the trees, and from them water gradually works down into the streams along underground drainage ways.

Within these mountaintop forest domains which have been set aside as National Forests and which are regulated by the Forest Service, there is protection. Here new growth is coming in and shrubs and grass cover the ground. Outside the National Forests, where grazing is little regulated if at all, trees are grazed of all branches within reach of the animals. The ground beneath them is bare of vegetation and gullies are working into the former smooth land beneath the piñon cover. While the upper forested watersheds supply by far the larger share of water flowing into reservoirs such as those at Boulder and Roosevelt Dams the lower slopes, in contrast, contribute comparatively little water but more than one-half the silt entering the reservoirs.

Silting has become a serious problem. More than a square mile of silt ten feet deep* is, each year, filling the reservoir at Roosevelt Dam, which means that each year fewer acres of rich irrigated land can be watered down in the Salt River Valley. Great fans of silt extend delta-like from the slopes of Apache Lake at Roosevelt Dam down into the waters of the lake, and along tributary reservoirs the the silt shows even more clearly. Below Horse Mesa Dam, on the upper reaches of Salt River a short distance below Roosevelt Dam, only a thin stream of water is flowing thru the silt which has all but filled the reservoir basin.

Erosion is even a more serious matter on the watershed of the Little Colorado River and its tributary branches in the Navajo Indian country in northeastern Arizona. All thru this region, formerly one of the richest grasslands in the West, where the grass grew "belly-high on the horse," overgrazing has been most severe. Whole areas are bare of grass, the soil is blown off, and wind erosion pavements are forming. In other places, over miles of territory only poor weedy growth appears, and great arroyos have cut their vertical sides down ten, twenty, and thirty feet into what was formerly a smooth unbroken range. Water has gathered into cattle trails or wagon ruts, cutting deeper after each storm until the drainage that, in past times, flowed over grasscovered range on the level so that Indians could take off a little irrigation for their fields, is now below the reach of men or animals. The Indians are moving farther back onto the valley sides, cultivating their fields with the small amount of water which flows down from the piñon covered slopes in the draws. Even on the slopes among the piñon the ground is bare, and there is no young growth of piñon trees.

In a similar range country just over the Arizona line in New Mexico, north of Gallup, is found a wonderful contrast to this denudation. At Mexican Springs about three years ago, the Soil Conservation Service began work. They mapped the area and studied it carefully in order to evolve the best methods for protecting the land from erosion. Deep wide arroyos had formed on the principal drainages. The grass cover apparently was destroyed. Thin starved cattle, belonging to the Navajo owners of the land, were ranging far and wide to find a meager feed.

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* Henry M. Eakin, Silting of Reservoir, Technical Bulletin No. 524, U. S. Dept. of Agriculture, 1936, p. 12.

For a few months all cattle were removed from the range within the Mexican Springs Demonstration Area. It was fenced. An earthen dam with protected spillways at each end was built across the main drainage. When rain fell, water began to pile up behind the dam. It flowed over the spillways spreading out over the bare range. Wherever it stood grass began to grow. Soon cattle were put back onto the range, but only in number commensurate with its carrying capacity. Inside the fence on the Mexican Springs area high native grass has been brought back thru this work of the Soil Conservation Service, and from across the valley it appears in autumn as a beautiful yellow-green strip against the brown of the rest of the range (Fig. 2). Outside the fence the ground

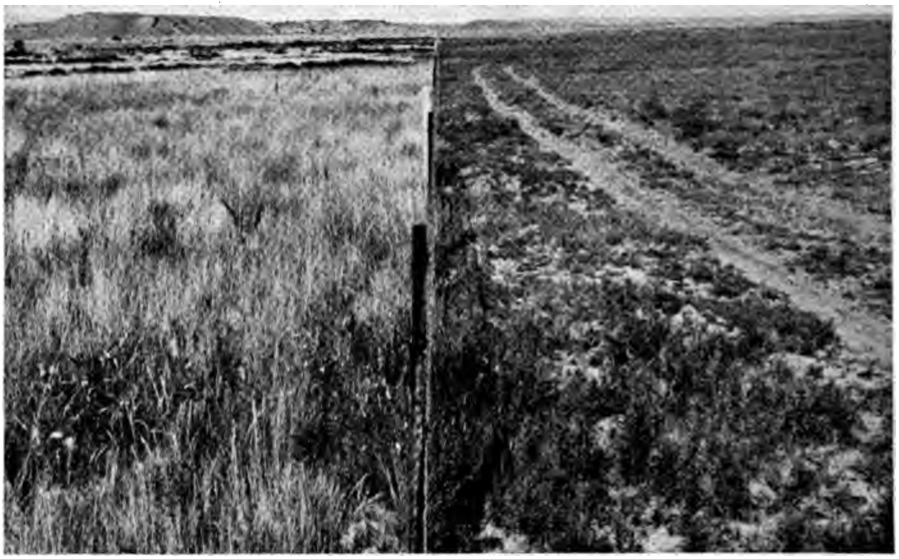

Fig. 2. The fence in the center of the picture bounds the demonstration project of the Soil Conversation Service at Mexican Springs, New Mexico. Grazing control and water conservation on the inside of the fence within the project have brought back the grass which stands thick and high, tho grazed. Outside the fence the land, weedy and bare in spots, has continued to be heavily overgrazed. This demonstrates graphically what proper regulation can do for western range lands. Photograph by Soil Conservation Service, 1936.

is almost bare, and only a weedy low thin growth appears. Grass from inside the Mexican Springs area weighs ten times as much as that in an equal area on the bare range. All these results have been acheived simply by saving the rainfall which falls so that it may soak into the ground as it formerly did on the virgin grass-covered range. No longer is water permitted to run off carrying away the soil and cutting the drainages deeper.

The Texas and Oklahoma Panhandles

About ten or twelve years ago land was broken for wheat in the Texas and Oklahoma Panhandles. It was the practice to burn the wheat stubble, leaving the fields bare during the period of summer fallow. Winds have torn into the bare soil carrying away much of the fine velvety most productive part, and in some places taking off all the soil and subsoil. This was the condition on the Peden field north of Dalhart, Texas, in 1935 when it lay bare and wind blown. The year 1936 was another drought year like that of 1935 and those immediately preceeding, but the owner of the field had entered into cooperation with the Soil Conservation Service, and had agreed to handle his large farm according to the coordinated program of that Service. He terraced his wind-blown field on the contour at a cost of $1.01 an acre in order to hold the May and other rains behind the terraces, then he seeded it to sorghum. In the fall of 1936 he harvested it at a net profit of $7.10 an acre. By leaving the sorghum stalks standing in the ground after combining, its roots and stalks now hold the soil from washing and blowing, thus providing the basis for permanent use of this seemingly destroyed land.

Soil has been piled up around more than one farmstead in the Texas and Oklahoma Panhandles. In some places fields have been so drifted and destroyed that owners have deserted their homes, tho in other cases it has been possible to dig out the houses and barns and continue use of the land. Drifting soil is piled along fence rows thruout the area, and after a dust storm roads are as impassable as those in the north following a blizzard, and cannot be used until they are dug out.

Blowing also has been particularly serious where stock have congregated and trampled the ground in the fields at windmill watering troughs, destroying grass cover and laying the soil bare to be torn into by the wind. For example, a few miles north of Dalhart, Texas, the land has been blown out near such a windmill over an area of a quarter to a half mile across and to a depth of twenty to thirty feet down to the caliche. Old deeply furrowed cattle trails lead down into the hollow as is characteristic of such blow-outs.

Contour plowing of cropped land and pasture furrows along the contour of rangeland are important elements in the restorative program of the Soil Conservation Service for the Texas and Oklahoma Panhandles. The value of contour plowing was vividly illustrated after a rainstorm in 1936. On one side of the road a field had been plowed straight up and down the hill. In this field all water ran down the furrows gullying them and settling in a large puddle at the foot of the slope. Only where the water stood in this puddle did it soak into the ground to any considerable depth and provide moisture for a future crop.

Directly across the road the farmer had contour plowed his field. On it the water stood behind each furrow, spread out over the entire field, and penetrated deep into the ground ever the entire field, providing moisture over all the field for the crop which would be sown there. Obviously the saving or losing of water over the field may and does mean to the farmer the difference between a crop harvest and a crop failure.

OKLAHOMA: CENTRAL AND SOUTHERN

In southern Oklahoma where the land begins to break off from the high plains toward the Red River, where both climate and soil are especially suited to cotton production, cotton has been raised for years on some of the slopes. The land has been plowed so that furrows run straight up and down the hill and run-off is concentrated in them, completely destroying the surface of the field, and carrying off all the topsoil and most of the subsoil. In contrast to this destructive farm practice, the Soil Conservation Service has introduced contour plowing and strip cropping. Alternate strips of cotton and Sudan grass have been plowed and planted on the contour. These hold most of the water in the fields. The close growing Sudan grass prevents soil wash and catches the wash from the clean-tilled cotton crop. These alternate strips of cotton and Sudan grass also tend to prevent wind erosion by acting as windbreaks. Thus thru prevention of wind and water erosion and conservation of water the yield is increased and the soil saved.

In southern Oklahoma there was located in the early days some of the richest cattle grazing lands from which animals were driven to railhead at Kansas City. Because of the fine soft character of the soil in this region it is peculiarly susceptible to erosion. Close grazing that laid bare the soil, and a cattle trail or a road have started what is today more than one deep gully. Since slopes in this area are long, it is sometimes difficult to catch water before it reaches the head of a gulley, but a terrace is carried around the gully head and drainage into it thus is cut off. This permits the gulley to heal itself for there is no scour thru it, slumps stay in place, and grass grows over the bare soil.

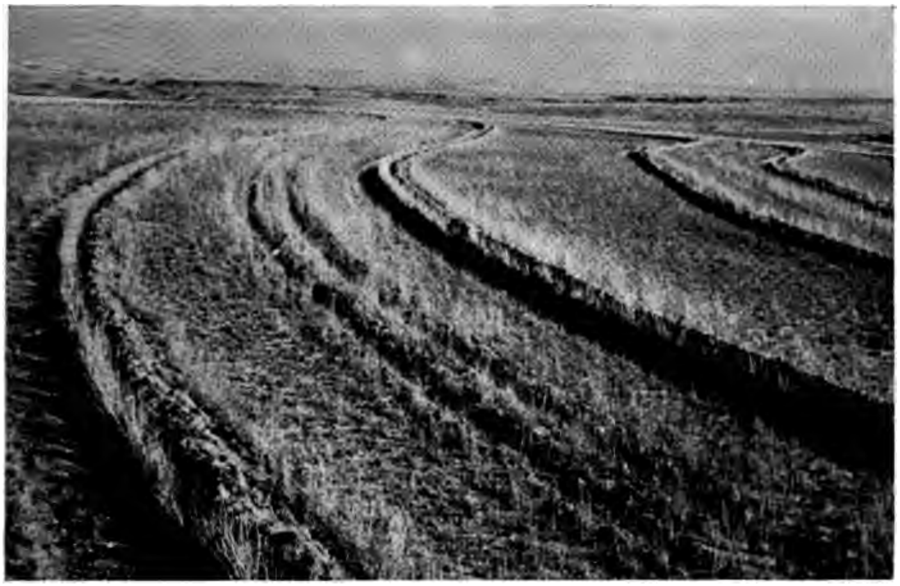

Fig. 3. Pasture furrows near Amarillo, Texas, have held the water so that it soaked into the ground. Note the thicker higher growth near the furrows, and the gradual spreading of grass over the between-furrow spaces. This picture was taken less than a year after the furrows were turned. Tests show that the weight of grass on this pasture was 154.8 per cent greater than on adjacent untreated range land. Photograph by Soil Conservation Service, 1936.

In this region if water can be kept on the range instead of flowing off immediately, the native grass will reestablish itself. In many pastures where the soil is almost bare and grass close-cropped to the roots, pasture furrows have been run on the contour. Soon grass commences to grow along the furrow. After each rain water fills the furrow and may back up behind it on the ground between the furrows. It soaks into the ground and grass begins to grow not only along the edge of the furrows, but runners spread out over the spaces between, until the grass forms a thick mat and stands high (Fig. 3). There are many native grass seeds lying dormant in the soil, and tiny roots which have been kept so closely grazed that the grass from them has been unnoticed on the weedy overgrazed range. With pasture furrows holding the water so that it may soak into the ground and stimulate germination of these dormant seeds and encourage the grass roots to grow, the thick native grass cover will be brought back to the range. If, then, grazing is regulated, abundant native grass will continue to cover the range as a permanent capital asset for future grazing.

CONCLUSION

These are some of the results obtained by the Soil Conservation Service thru its coordinated program. Soil is being held in place, erosion stopped and prevented, and the native range grasses brought back. Thru this soil conserving work a sound foundation is being preserved for the agriculture of the future. If the downward course in soil loss were to continue, American living standards would follow the same downward path. By restoring and preserving the soil thru the coordinated program of the Soil Conservation Service, the Nation will possess a permanent foundation for its rich agricultural production and for a high standard of living. In this work of the Soil Conservation Service is bound up the entire future welfare of the Nation.

MERSEYSIDE*

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Pittsburgh, Pennsylvania

Merseyside, the second largest conurbation in the United King- n, had a population of approximately 1,500,000 in 1931, and an a of somewhat more than 170 square miles. Four inter-related ts comprise the conurbation, namely, Liverpool, Widnes, War- gton and Ellesmere Port, named in order of area occupied (Fig. This conurbation is situated in Western England on both es of the navigable Mersey estuary which lies on the seaward rgin of the largest area of dense population in the British Isles. rseyside is chiefly interested in the commercial and the manufac- al industries. There is much interdependence between the conur- ion and the most densely populated and most highly specialized ustrial areas of Britain which are in the hinterland.

LAND UTILIZATION

Land utilization on Merseyside is related generally to the Mer- estuary which is deepest near its mouth. Commercial uses of d are of parmount importance along the bottle-neck channel be- en the outer and inner estuaries. In that part of the estuary the al range is nearly 30 feet, and the ebb and flow of a large volume water thru the constricted neck of the channel, with a velocity to 6 or 7 miles per hour, produces a scouring action which keeps channel at a natural depth of 50 to 60 feet at the lowest spring es. An immense system of docks, warehouses, transit sheds, and er port forms stretches for nearly 8 miles along the waterfront the Lancashire side of the Liverpool Unit. A less extensive sys- of port forms, about 2 miles, surrounds East and West Floats the Cheshire side. Bromborough Pool has recently been im- ved to accommodate ocean-going vessels. Along the shallower ts of the estuary where navigability is reduced on account of ge amounts of sand exposed at low tide, the land used for t purposes is less extensive, and is found mostly along the nchester Ship Canal. Railway freight stations, goods yards, and rage spaces have developed inland near railway sidings and ter-

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* The writer is indebted to Mr. L. A. P. Warner, General Manager and Secretary, sey Docks and Harbour Board, Liverpool, England, for furnishing the areal photo- hs.

minals. In each urban unit, except the Ellesmere Port Unit, a c
business district extends inland from the estuary. An effecti
tem of roads, canals, and railroads integrates the constituent
of Merseyside, and binds Merseyside to the hinterland (F

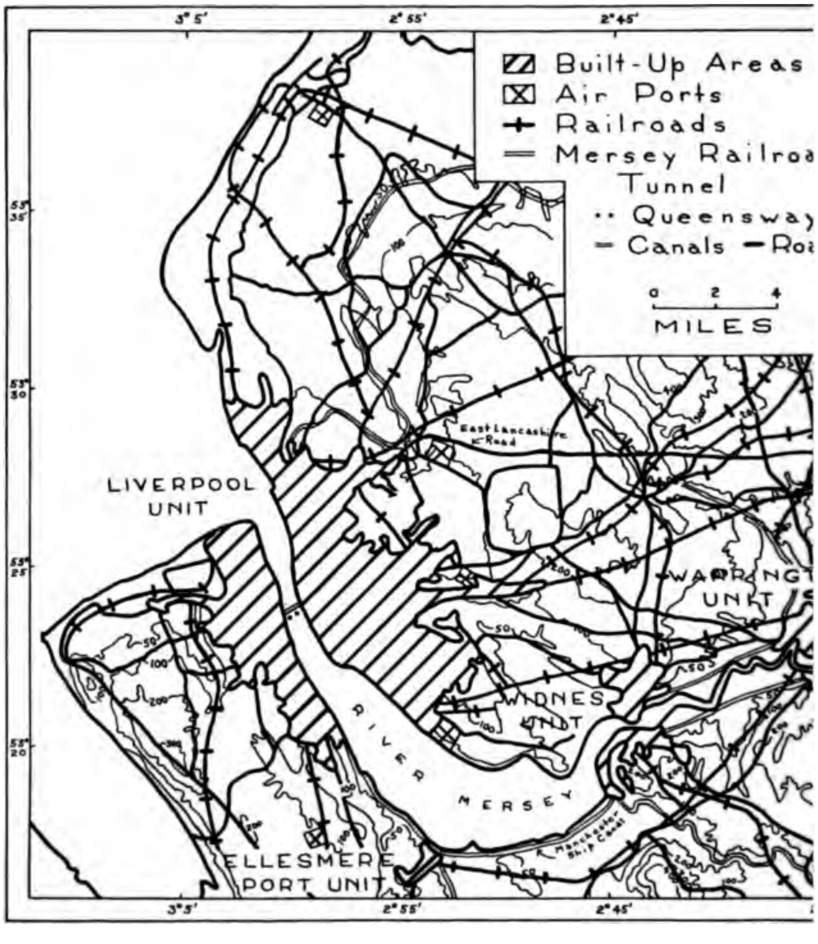


Fig. 1. Built-up areas and transportation of Merseyside in relation to reli

Adjacent to the commercial uses of land are congested re
tial districts with few open spaces beyond which is a broke
of suburban housing and large open spaces: Manufactural u
land have a more equable distribution within the conurbatio
have the commercial uses of land. The factories are scattere
out each urban unit with noticeable concentrations along som
of the docks, the rivers, the canals, and the main line railwa

The land utilization pattern on Merseyside is explained in part by natural environmental conditions. The land is comparatively level on Merseyside, there being few areas more than 200 feet in elevation. The Mersey estuary is navigable and deepest near its mouth, and the channel leading to the Manchester Ship Canal. Areas of blown sand to the north of Liverpool and Wallasey have been suitable for housing purposes and out-door recreation facilities. Underlying sandstone rock has furnished substantial building sites and some building materials, and has hindered very little the making of tunnels. Lastly, the well-developed system of regional transport facilitates the disposal of raw materials to manufacturing firms everywhere on Merseyside, and aids in procuring coal and salt from the near hinterland.

Industrial Pattern

Commercial and manufactural industries were the outstanding industries on Merseyside in 1931, each accounting for one-third of the total number of employed workers. In that same year approximately 90 per cent of all workers in industry were in the Liverpool Unit. Partly because of its size and strategic situation at the mouth of the estuary that urban unit had the largest percentage of workers in each order of manufactures.

Commercial Industries. The commercial industries have centered on the Liverpool Unit to a greater degree than have the manufactural industries. Ninety-four per cent of the commercial workers, but only 80 per cent of the manufactural workers on Merseyside in 1931 were in the Liverpool Unit. The Port of Liverpool is the second port in the United Kingdom both in tonnage and value.

For the heterogeneous class of commodities handled at the Port of Liverpool every type of modern port equipment is available and capable of handling the general and specialized cargo of ocean liner, tramp steamer, and coasting vessel.

Nowhere in western England is there a transport center that rivals that of Merseyside. Many arterial first class roads, main line railroads, canals, and airways furnish transport to suburban centers and interior regions. All the roads and railroads focus on Pierhead in Liverpool (Fig. 1), those on the Cheshire side reach Pierhead by way of ferries or tunnels under the Mersey. Main arterial canals, in turn fed by smaller canals, connect Merseyside with inland industrial regions. Only in a few places are the directions of transport radials greatly affected by the physical conformation of the terrain, or by the underlying rocks thru which tunnels have been bored. Direct routes are generally pursued partly on account of the comparatively level terrain. Within the conurbation existing roads have avoided the higher elevations and followed river valleys to a lesser degree than have railroads.

The Liverpood-East Lancashire Road, opened to traffic in 1933, was built to help alleviate the increasing traffic on the Liverpool-Warrington-Manchester Road (Fig. 1). It passes thru open country, with the exception of a few coal mining areas, and enters Liverpool on the north where there are connections with other roads leading thru Queensway to Birkenhead, Wirral, and North Wales.

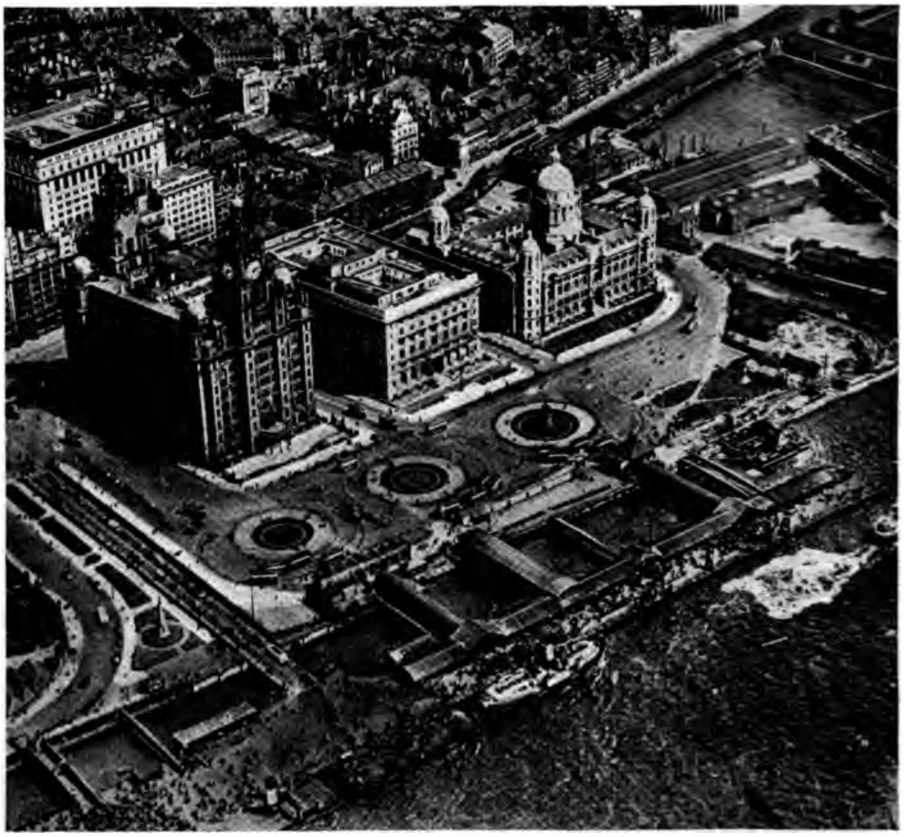


Fig. 2. Areal view of pierhead buildings and landing stage, Liverpool

The Mersey Road Tunnel, officially named Queensway, is the largest subaqueous vehicle tunnel ever to be built (Fig. 1). It was completed in 1934. All main highways to Liverpool from the industrial areas in the North, the Midlands, and the South lead directly into the tunnel. Queensway assists in the free movement of Liverpool's local traffic, and places the Birkenhead dock system as well as the manufacturing areas on the Cheshire side of the Liverpool Unit on an equality, geographically, with those on the Lancashire side. The tunnel tends to increase the commercial predominance of Liverpool over North Wales and Cheshire and to hasten the process of centralization of the Liverpool business district (Fig. 2).

The outstanding importance of Merseyside as a commercial center and the concentration of that industry in the Liverpool Unit is due partly to natural factors. The Liverpool Unit is adjacent to the deepest parts of the Mersey estuary. The character of the terrain is fairly level. The old tidal pools, Bromborough and Wallasey, that once flowed into the Mersey, have been converted into port forms. Queensway and the East Lancashire Road are expected to enhance further the importance of the central business district in Liverpool. Lastly, the distribution of the more bulky commodities, salt, pottery, coal, and others, is made possible by the inland canals.

Sea Trade. The Port of Liverpool, a general and an industrial port, led all other ports in the United Kingdom in foreign export trade and in coasting trade with Northern Ireland between 1929 and 1933. It was second only to London in the tonnage and value of all trade, in foreign imports, and in general coasting trade. Moreover, it was surpassed only by Southampton in passenger trade. The downward trend of Merseyside's foreign trade, approximately 50 per cent between 1929 and 1933, was comparable to that of the United Kingdom. Transit trade and passenger trade declined in the post-war period. Almost three-fourths of the trade of the Port was related to British industry. Nearly one-half of the total value of imported commodities were foods, and one-third were industrial raw materials while almost nine-tenths of the exports were manufactures. In foreign trade the total arrivals were much larger than the total departures. There were more vessels leaving than arriving in ballast. That characteristic is to be expected in a region that needs to import large amounts of foods and industrial raw materials. The Port of Liverpool trades with practically every continent and with almost every port in the world. It is the one British port preëminently concerned with the trade of the Atlantic Coast of North America.

The high rank of Merseyside as a trading center is attributed chiefly to natural items. The conurbation has a favorable position in relation to industrial Britain and the Atlantic Coast of North America, but a remote location with respect to the Continent. The very dense and highly specialized industrial population in the hinterland demands large quantities of foods and raw materials as well as outlets for manufactured wares. The purchasing power of peoples living in low and low-middle latitude regions has decreased making them less prone to purchase the high-quality British goods. Certain foreign nations such as Japan have been able to capture the markets in those regions. And, the modern port equipment on Merseyside is better able to handle the ocean leviathans than is the equipment at numerous smaller ports in the United Kingdom (Fig. 3).

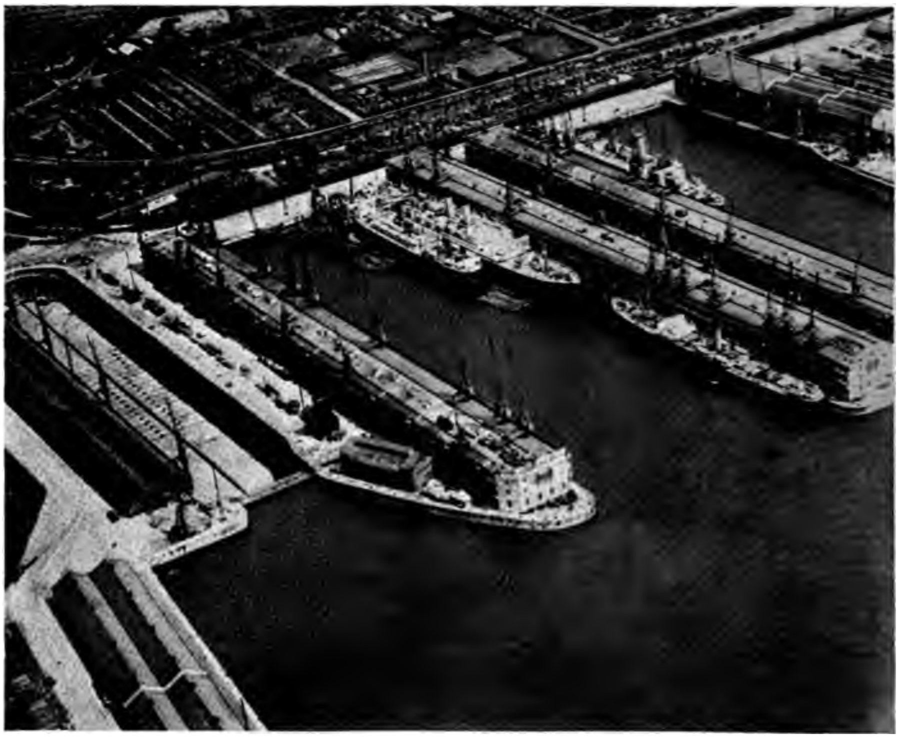


Fig. 3. Areal view of the Gladstone docks, Liverpool

Manufactural Industries. The importance of Merseyside as a commercial center has tended to minimize its importance as a manufactural center. This impression is probably due to the diversification in the size of the manufactural forms, in the quantities and kinds of goods fabricated, and in the areal distribution of the factories. None have centered on Merseyside, with the exception of flour milling and chemical manufacturing, to a greater degree than in any other region of the United Kingdom. That manufacturing has tended to expand recently is indicated by the many new industrial plants that have been established on Merseyside since 1924.

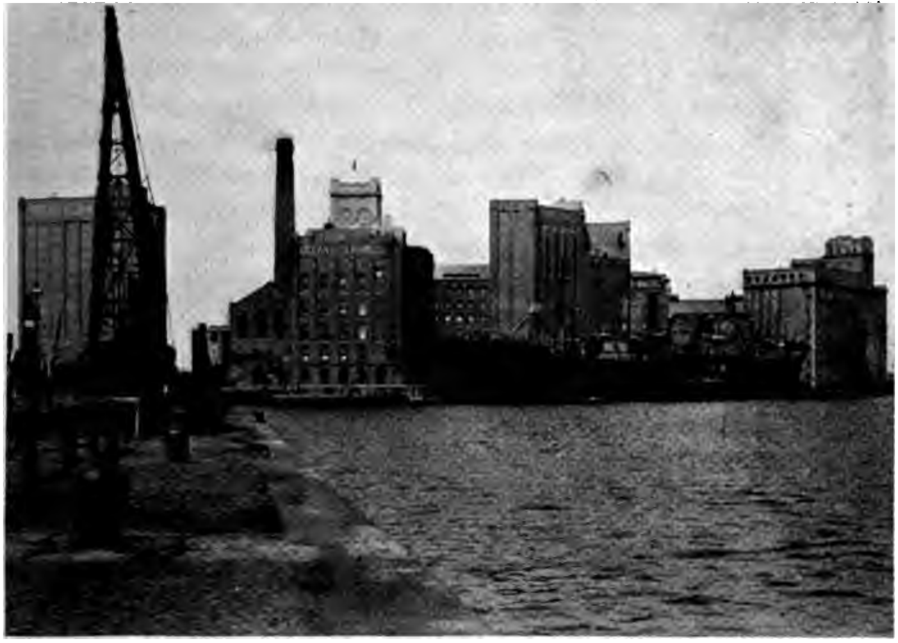


Fig. 4. Flour Mills, west float, Birkenhead

The manufactural forms do not conform strictly to zones. However, there are noticeable concentrations in places near docks and main transport radials. Elsewhere they are scattered thruout the built-up areas. Most of the orders of manufactures are associated with the Port and its trade, or with the densely peopled areas within the conurbation and near hinterland and their needs. There are certain areal specializations of manufactures such as, soap making in Port Sunlight, alkali manufacturing in Widnes, flour milling (Fig. 4) and shipbuilding in Birkenhead, oil refining in Stanlow and

Dingle, wire making in Warrington, artificial silk manufacturing in Aintree, jam manufacturing in Fazakerley, and sugar refining in Liverpool.

The manufactural industries are explained in larger measure by natural conditions. The majority of plants have been built on land 100 feet and less in elevation. The world-wide ramifications of the trade of the Port supply a somewhat heterogeneous class of bulky raw materials, and an outlet for manufactured goods. The deep estuary is adapted to shipbuilding. The very dense population in the conurbation and in the hinterland furnishes a home market as well as a constant supply of labor. Cheap hydro-electric power, gas, and water of high quality is available, and is comparably cheaper than in most other large industrial centers in Britain. Coalfields in South Lancashire and North Wales, salt deposits in and around Northwich and Fleetwood, and limestone, red sandstone, and boulder clay on Merseyside are accessible. Lastly, the transport lines are useful not as sites for factories, but as means of conveying manufactured goods, laborers, and raw materials.

Pattern of Whole

Merseyside then is a commercial and manufactural region ranking second, as does the Port of Liverpool, among other major conurbations of the United Kingdom. Those distinguishing characteristics are related in part to the comparatively level relief, mostly less than 200 feet. Areas of sandstone, boulder clay, alluvium, and blown sand lie within the built-up areas while coal measures and salt deposits lie in the hinterland. The navigable bottle-neck Mersey estuary has numerous sand bars in the channels of the outer and inner estuaries. The largest areas of dense population and the most highly specialized industrial areas of Britain lie in the hinterland. And finally, the conurbation has a strategic location on the west coast of Great Britain, facing Ireland and the Atlantic coast of North America.

IGUALA: A TOWN IN SOUTHWESTERN MEXICO

Ben F. Lemert and Rose V. Lemert
Duke University

The largest city along the automobile highway between Mexico, D.F., and Acapulco at its Pacific terminal is Iguala. The highway passes right thru Cuernavaca with its crowds of tourists. It skirts Taxco but that city has already built down to it. Iguala lies about a quarter of a mile to the west of the highway. The road leading in to the city is always either dusty or muddy and far from smooth. Trees hide the buildings for the Indian likes to sit in the shade.

History mentions Iguala as the place where Vicente Guerrero, the mule driver, met Agustin Iturbide, the noble, and agreed upon the Plan de Iguala promoting the independence of Mexico. The guidebooks either omit the name of the city or give it slight attention. There are no notable ruins close, the Pacific is only 165 miles south, the tourists do not like anything calling for effort on their part, lack imagination, and the fascinating stories to be read in the faces of the 12,000 people in Iguala, and interpreted from their economic activities, call for thinking and the use of geographical knowledge.

Iguala lies in a little valley which roughly assumes the shape of a crescent. The valley is one of the parallel valleys which occur repeatedly after one passes over the volcanic mountain barrier south of the Valley of Mexico. It is a minor flexure in the Balsas Portal, a geosyncline that is thought to have extended from the Gulf of Mexico to the Pacific. For an extended period the débris from the mountains to the north and to the south washed into it. Finally, during the Laramide Revolution, a time of great crustal disturbance in North America, the Balsas Portal was elevated above sea level. The limestone, shale, and sandstone deposits were faulted and folded into parallel ridges extending east and west, and between each ridge a valley remained. The elevation of the valley floors trends lower as the Pacific is approached. The Balsas River, rising in the vicinity of Puebla, flows for more than 500 miles thru this region before it turns into the Pacific. Many smaller valleys are tributary to it. That in which Iguala is located is one of them.

Iguala is a tropical city in a tropical valley. The equator is only 18° southward, the sun is always high in the sky at noon, and the floor of the valley is but 2,820 feet above sea level. There are no jungles, no tropical rainforests. The floor of the valley is covered with grass with here and there patches of corn, sugar cane, and rice. The days are warm if one is exposed to the sun. The heat is not uncomfortable. The sensible temperatures are not oppressive. It is always cool in the shade. The air is dry. The coolness of the shade is made even more apparent because of the intense light of the sun. When that body is directly overhead the white light seems to penetrate the human flesh, especially that of the white man, producing a feeling of exhaustion that is more like mountain sickness than heat prostration.

The floor of the valley is grass covered because there is not enough annual precipitation to support trees. Mountains surround the valley. The few small streams either flow into Lake Tuxpam in the eastern end of the valley, or cut their way thru the mountain barriers and reach the Balsas River. For the most part these streams carry little water except at times of thunderstorms. From October to May the northeast trade winds blow across the valley. Since these winds are blowing towards a warmer region their ability to absorb moisture is continually increasing. Having passed over high mountain ranges before reaching the valley about Iguala, they have already precipitated much of the moisture they might have been carrying. From May to October the rain comes in the form of convectional storms for solar insolation is intense while the upward movement of air currents is violent. The high sun speeds up evaporation and lowers the utility of the precipitation.

The little stream courses across the valley are lined with trees for such location permits the roots to obtain a year-round supply of moisture. The grass of the valley extends right up to the base of the mountains where xerophytic vegetation takes its place, especially on the leeward southfacing slopes. At higher elevations where windward exposures extract enough moisture from the winds, oak, pine, and cedar forests grow. At other places such windward exposures are not existent, the mountain sides remain barren and are deeply eroded by the torrents which rush down across them during the occasional cloudburst-type of thunderstorms.

The streams, in crossing the valley have become deeply incised, some places from 10 to 20 feet beneath the valley floor. Cusps formed by the meanders of the currents at different levels form wide platforms that almost might be classed as second bottoms. Normally the streams are mere trickles of water. However, most of them have cut their way down thru the mountains passing thru deep barrancas. The mountain slopes on either side are high and steep and form large drainage surfaces. The wet season thunderstorms, occurring in mid-afternoon or during the night, may be of extreme violence. We have seen creeks which were almost dry at sunset, turned into raging torrents less than an hour after the storm broke. The incised valleys fill quickly, the water spreads over all the land for many yards on either side of the stream channel and the current carries a large amount of débris in its rush downstream. The heavy downpour brings down large quantities of cold air, the water is icy cold, and the temperature for the few hours between termination of the storm, and daybreak, is delightfully cool if not chilly. The morning sun floods its light thru a clear, bracing atmosphere. The ground is already dry for the soil is porous and the water that does not run off quickly, sinks below the surface. An hour after sunrise everything is dry again, the trickle of the water in the creek is clear. One, unfamiliar with weather conditions in such regions could not realize the danger of pitching his tent anywhere near the streams. The scene during the storm, with water leaping down the mountain sides, piling up at the bottom of the gorge and hurling huge boulders before it, is not easily forgotten.

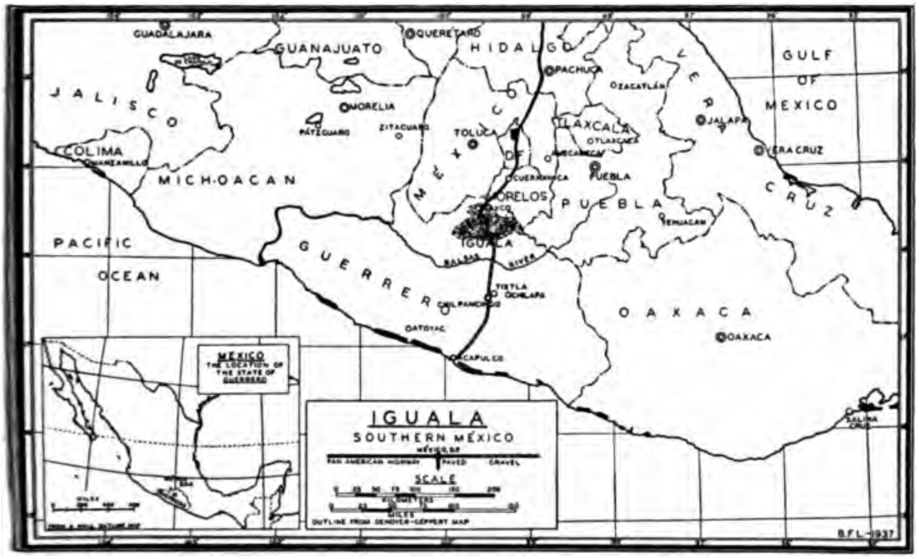


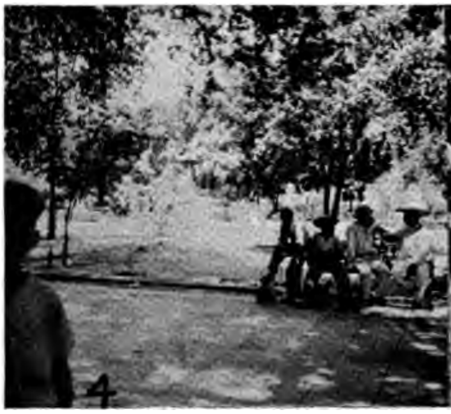
Fig. 1

Dams could be built across these mountain valleys to hold back the water for irrigation but they would not be feasible. Each year they would have to be built higher and higher because of the piling-up of débris behind them. The barren mountain slopes could not be covered with vegetation for they would not support it. However, where they are not too high, they could support large groves of olive trees. Mexico imports over one million pesos worth of olive oil annually. There is no reason why this could not be raised within its own territory.

The grassy plains about Iguala are occupied by cattle, sheep, goats, horses and burros. More animals could be supported. However, the state of Guerrero has been the scene of intense revolutionary activities during the struggles of the Mexican people. Raiding armies eat meat animals and ride away on beasts of burden. It takes time to recover confidence in government and to breed up new herds. With many acres to wander over, the sheep and goats seek the higher sides of the valleys among the outcrops of limestone. The cattle always graze along the highway and even the horses and burros tend to follow their example.

Most of the people utilizing the land in the valley live in Iguala, but up every barranca opening into the valley are Indians living on small plots of land just above reach of flood waters. Some of the huts are made of adobe, especially if at higher elevations for the temperatures in such locations are likely to be rather cold at night. At lower elevations the huts are made of interwoven sticks and grass. Both types of dwellings are covered with thatched roofs. Around the houses are small gardens where they produce the vegetables they take to the market in Iguala. Each family also raises some chickens and turkeys, some pigs, has a cow or two and the inevitable burros. All produce products contributing to the economy of the household.

Of course all the land available is planted with corn and beans, the food of the Mexican people. They eat the corn from the cob after boiling it in water before removing the husk. The commonest form of use is the tortilla. The housewife grinds up the dry kernels of corn in a metate, a piece of porphyry hollowed out in the center, the grinding being done by means of rubbing the kernels around the vessel and pounding them with another piece of porphyry. After the flour is made the woman squats before another piece of porphyry, this time the stone being rectangular shaped with a depression hollowed out on top. Taking some of the ground grain from a jar the woman places it on the metate (same name as centrations of people, is rectangular, the plaza in the center. The streets are prevailingly narrow, some of them twenty feet wide, most not so wide. Streets immediately bordering the plaza and for a block or two from it are cobbled, the surface of each street slanting downward toward the center where the rain water collects and runs off, and where too, quite often waste water is thrown to make its way to lower levels or evaporate in the dry hot atmosphere. Many of the streets are not only unpaved, but so rough the smoothest portions are those worn into paths by the tramp of thousands of bare feet day after day, year after year. Some of the streets are impassable mud holes, the pools of water covered with green scum.



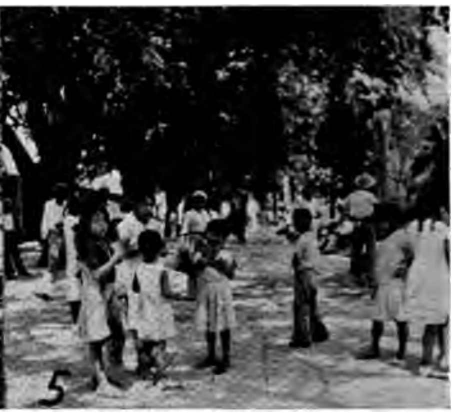


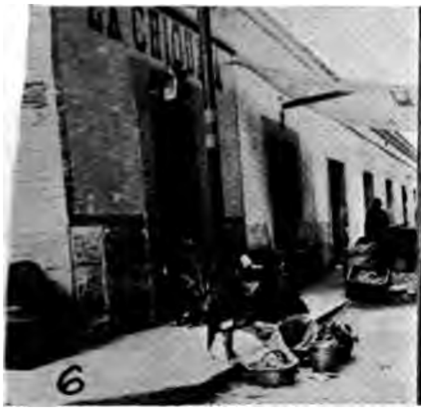
Fig. 4. The shade of the plaza is always occupied by men and women discussing the events of the times. Like the Khirghiz nomads, these people are capable of great exertion when necessary and also capable of resting between such periods.

Fig. 5. Many children play in the plaza. They are quiet and well-behaved at all times, tho they seem to have lots of fun.

The spacious plaza is surrounded by trees, a bandstand in the center with walks lined with flower beds radiating in all directions. The plaza is beautiful, always full of people sitting in the shade of the trees or wandering between the flowers. Indian children play quietly along the walks getting just as much fun out of their play as incorrigible American children playing wild Indian. Mexican Indian children are without exception the best behaved children we have ever encountered. However, quite often boys and girls of 15 to 20 years of the so-called better families are as rude as those of similarly situated American families.

Of course the church faces the plaza at Iguala, but stands back about fifty feet from it. This is unfortunate for the church since the market surrounds it on three sides and has gradually spread out in front of it until tradesmen's booths almost hide the edifice.

The market, itself, is extensive, not only occupying many square yards of roofed-in space, but spreading over all the streets nearby. Some of the streets occupied by the overflow are shaded by large cotton sheets stretched from the buildings on either side of the street. In other streets the venders sit in doorways, their wares, if not quickly perishable, spread out in the glaring sunlight. The pedestrian walks in the middle of the street in such places. However, the sidewalks are so narrow it is easier to walk there anyway.



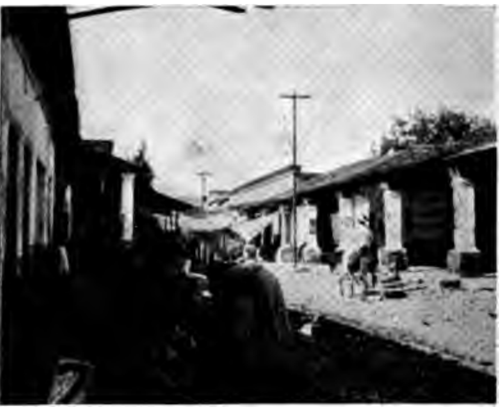


Fig. 6. The market spreads over all the nearby streets. Women sit on the sidewalks, their wares exposed to the bright sunlight. Most of the Indians are very dark with a reddish tint to the skin. Their hair is straight and black.

Fig. 7. Another street adjacent to the market. The streets near the plaza are cobbled, slanting toward the center of the street. This forms a depression down which rainwater flows and where too, waste water is thrown to run off or evaporate in the hot sun.

The Iguala market is exceptionally large and draws trade from a wide area in which there is a climatic range from tropic to almost Arctic climates. This results in both horizontal and vertical trading which are illustrated by the farmer who trades rice for sugar cane, both produced in the same climate while two other farmers exchange bananas and apples, representing two climatic zones, while a third set of exchanges might involve coffee as intermediate between the tropical and the temperate producing areas. An extreme example, an actual case of which we witnessed three years ago in this region was ice formed on the mountain tops being sold in the hot lowlands. It had been cut from streams or ponds at high elevations and still contained dirt and weeds rendering it unfit for use except as an indirect cooling agent.

One may obtain practically anything he needs in such a market, if he does not try to maintain a higher standard of living than that existing in the surrounding region. Some of the methods of selling are unique. The meat display is large and consists of beef, pork, mutton, goat, fowls, rabbits and even reptiles. It is possible to buy a piece of meat from any portion of the carcass by simply pointing to the spot where one wishes a chunk cut off. On the counters selling fowls are piles of legs, wings, breasts, livers, gizzards, etc., and one may buy as many of one kind as he desires. We purchased a half dozen chicken legs one day, the attendant first wrapping them in cool, wet leaves, then covering the package with a large dry leaf assuring us they would be fresh for a long time. Another day we purchased a piece of meat from a side of beef and asked to have it cut into steaks. The attendant sliced it skillfully, then taking each piece of meat, he laid it on a flat stone and pounded it with a wooden paddle. He informed us such procedure would make the steaks deliciously tender. They were. The venders also have grinding machines and will make hamburger when requested. However, the machines never look very clean.

The hardware market is striking. In addition to new materials, there is a great display of second-hand articles, especially nuts, bolts, screws and nails. The piles look like they had been culled from a dumping ground. However, when one is in search of a nut or bolt the like of which he cannot buy in a hardware store, he may be able to find it in those piles. They are always surrounded by men hunting for certain pieces and the price of any piece which suits the needs of the customer is the same as tho the article were new. It may be even higher for the trader has been watching the customer search, gauging his need for whatever he is after, and charges what he thinks the customer will pay.

A survey of the market shows the foodstuffs are good and the prices low. The products of local handicraft are well-made, and indicate skill, unlimited patience and love of the artistic. Materials brought in from beyond the local trading area are for the most part, very poor in quality and too high in price. A geographic analysis of the market in all its phases produces much interesting information concerning the region.

Iguala is connected with Mexico, D.F., by railroad but the grades are steep and such transportation is costly. Some mining is carried on back in the mountains, there is some subsistence-type manufacturing in the city, but the chief function of the community is to serve as a trading center of an agricultural region. Being off the automobile highway, Iguala does not enjoy much tourist trade and seems to make no effort to get it. Other Mexican towns adjacent to paved highways are changing very rapidly. Acapulco is paving its streets, laying out sub-divisions, building new hotels and remodeling old ones to take care of the increasing number of visitors it is already having difficulty in accommodating. Mexico is becoming a land of change. It is starting with the accumulated knowledge of the modern world to aid its progress. The pace should be rapid. It is not logical to expect Iguala to resist modernization much longer.

EGYPT'S PLACE IN THE WORLD COTTON DRAMA

RALPH S. HARRIS
Westport High School, Kansas City, Missouri

INTRODUCTION OF COTTON INTO EGYPT

A little over a century ago, Jumel, a French-Swiss engineer, saw cotton plants grown for purely decorative purposes in the garden of Maho Bey in the city of Cairo. At once he recognized the possibilities of growing cotton for commercial production. He succeeded in interesting Mohammed Aly, the founder of the present Egyptian dynasty, who undertook the task of cultivating a new Jumel or Maho cotton as a perennial. Its production on a large scale soon proved to be a successful commercial enterprise. Pleased with the results, Mohammed Aly tried further experiments. Foreign seed was imported, principally Sea Island and Brazilian. Thru the contagiousness of Jumel's enthusiasm, Mohammed Aly caused the development of the annual type of cotton that was purely Egyptian. Its long, strong fibres of fine quality, silky texture, and brown color, have given it a very high value and created for it a special Egyptian market.

The growth of the cotton has been dependent upon the growth of irrigation facilities. Because primitive methods of lifting water prevailed during Mohammed Aly's time, cotton was an unprofitable crop when compared with other staples. For example, one water wheel with eight oxen irrigated three feddans of cotton,[1] as compared with a combined cultivation of seven feddans of wheat, two feddans of millet, and eight feddans of Indian corn.

Under the conditions just cited, one wonders why cotton was grown at all. The secret rests in the fact that the cultivator had no choice in the matter, but was compelled to grow it. Compulsion, however, with regard to cotton cultivation ceased with the death of Mohammed Aly in 1849. There is a probability that cotton cultivation might have been given up entirely had it not been for a combination of factors that intervened.

INFLUENCE OF THE CIVIL WAR AND OTHER FACTORS

Certain factors, together with the Civil War in America which resulted in a serious depletion of the world's cotton supplies, caused the price of cotton to rise rapidly. The purchase of all cotton

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[1] One feddan equals 1.038 acres.

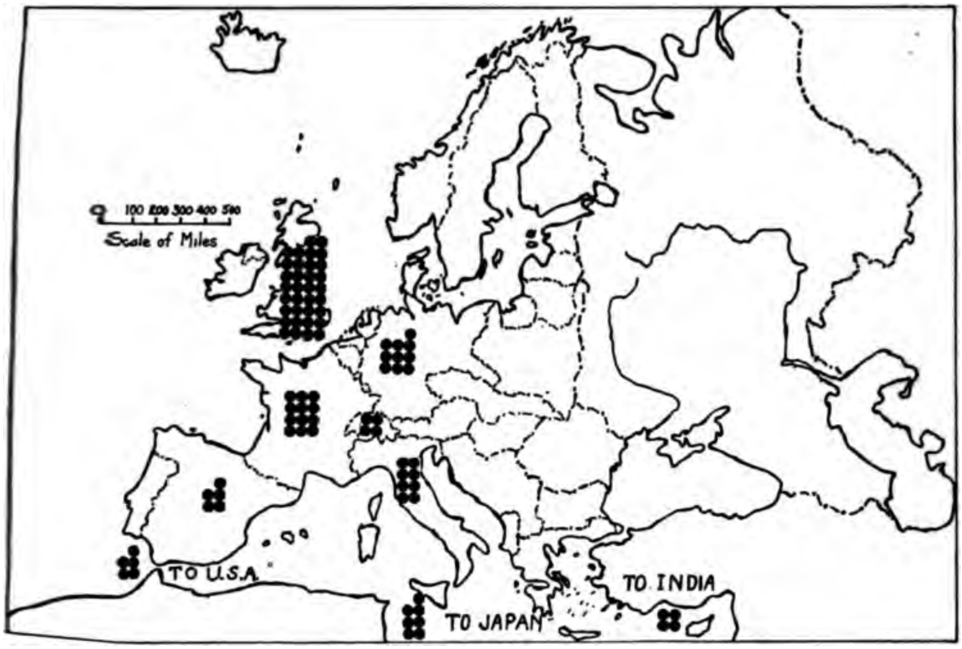

Fig. 1. Importing countries of Egyptian cotton. One dot represents one per cent of Egyptian cotton exports. The computations represent a five-year average from 1930 to 1934. The figures were compiled from the 1933-1934 Annuaire Statistique, Ministry of Finance, Egyptian Government, Cairo, 1936.

grown in Egypt was a state monopoly before Aly's death, but after that it was abolished. Also, an export duty was gradually reduced from 10 to one per cent as a result of a Turkish treaty. Thus, a new impetus was given to cotton cultivation, and the importance of the Egyptian crop as a part of the world's supply was established. At the beginning of the conflict, the British cotton mills were dependent upon the Southern States of the United States for nearly 90 per cent of the raw staple. Less than five per cent of the cotton imports of the United Kingdom in 1860 came from Egypt. India supplied some cotton to England, but it was no substitute for the high quality American product. On the other hand, Egyptian cotton was the best of any except the Sea Island fiber. Thus, Egypt won a place for itself in spite of the Indian competition, as much of the "Surat" or Indian cotton was of short staple, ill-prepared, ill-cleaned, and even adulterated with mud, leaves, and stones. Furthermore, Manchester had never liked the Indian variety.[3]

[3] W. T. M. Torrens. Lancashire's Lesson; or The Need of a Settled Policy in Times of Exceptional Stress, pp. 10 and 16. Trubner and Company, London. 1864.

Less than five per cent of the cotton imports of the United Kingdom came from Egypt before the American Civil War, but th picture changed after the struggle was over. For the five-yea period 1930 to 1934, England received 34 per cent of the tota of Egypt's cotton exports, which represented slightly less tha 20 per cent of the Island's average imports, as the five-year perio 1924 to 1928 indicated (See Fig. 1). It is not as dependent upo Egypt's crop now, however, as it was upon the crop of the Unite States during and before the Civil War.

EGYPT'S PLACE IN WORLD COTTON

From the whirl of events during and following the Civil Wa Egypt won a place of importance in the world's cotton dram Primarily an agricultural country, cotton comprises about 85 pe cent of the exports and five-sixths of the population live on the lan Egypt manufactures little and depends largely on cotton for th imports of manufactured goods.

For the five-year period 1929-1930 thru 1933-1934, Egyp ranked fifth in world cotton production (See Fig. 2.). For the sam five-year period, it produced about six per cent of the world' total.

Egyptian cotton is, after Indian, the leading competitor of th staple produced in the United States. Regardless of the fact tha Russia and China produce more fiber than Egypt, Egypt's produc is commercially more significant, for the Russian and Chines products do not move in international trade.

CHIEF SOURCE OF LONG STAPLE COTTON

Today agriculture represents 85 percent of the value of a production in Egypt. Of this share, cotton accounts for nearl 43 per cent. In fact, about 35 per cent of all cultivated land in Egyp is under cotton each year. Furthermore, Egypt grows from 40 t 50 per cent of the long staple cotton (1 1/8 inches or longer) pr duced in the world, while the United States raises 20 to 25 per cen Egyptian cotton is characterized by its unusual strength, lengt luster, and silkiness. It is widely used in the manufacture of fabric requiring lightness and durability. At present, about one-third o the crop is of the extra long staple varieties of over 1 3/8 inche fiber length. The remainder consists mainly of so-called "Uppers,' a cotton having a staple length of 1 1/8 to 1 3/16 inches. For purposes of convenience, the Egyptian crop is classified under thre categories, namely, short, middle, and long staple. The former, or Uppers type, is 1 3/16 inches or less; middle staple cotton is 1 2/8 to 1 5/16 inches, while long staple or "Sakellaridis" type is 1 3/8 inches and over. The Egyptian government at present is encouraging the cultivation of eleven varieties of which five are long staple cotton, four are of the medium staple, and two, the so-called Uppers varieties, short staple types. During recent years there has been a marked trend away from the cultivation of long staple cotton. At one time it accounted for two-thirds to three-fourths of the crop, but today it amounts to only one-third. If present government policies continue, only 20 to 25 per cent of the crop will consist of long staple varieties.

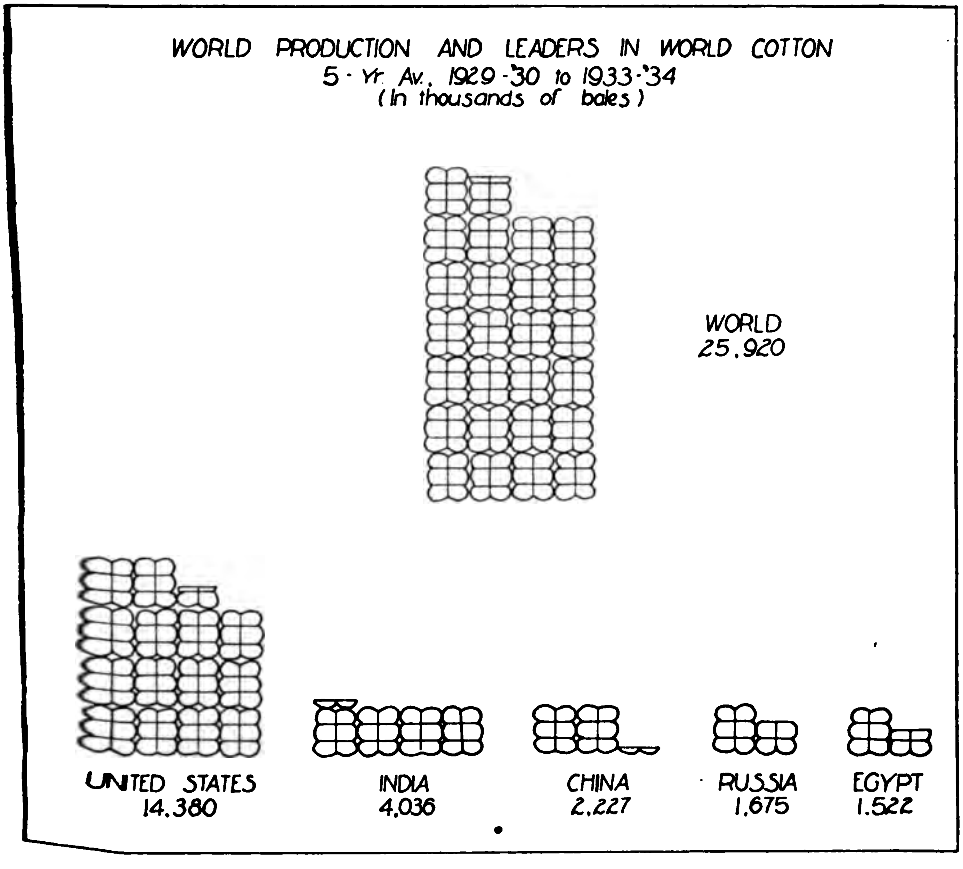

Fig. 2. World production and leaders in world cotton

Competition

A long staple, Sakellaridis, cotton competes directly with cotton grown in Arizona, whereas Uppers is a competitor of long staple cotton from the Mississippi Delta, Arkansas, Louisiana, and South Carolina. Egyptian cotton must also compete in some degree with the products of other countries which have stimulated production recently, largely as a result of the American acreage restriction program. In most of them it is beyond the experimental stage.[3]

Price of Sakellaridis

One reason for the former large acreage of Sakellaridis was its wide price margin over the shorter staples. During the six years 1924-1925 to 1929-1930, the price of Sakellaridis averaged 32 per cent above that of Uppers, but in 1932-1933 the price margin was only 11 per cent. Because of this narrow margin, together with the fact that the long staple cottons have relatively lower yields and lower gin turnouts than shorter staples, there has been a marked trend toward raising a shorter staple, higher yielding cotton.[4] In spite of the Egyptian farmers being alarmed over a low yield, their crops average twice that of the "rain grown" cotton of the United States.

Summary

Egyptian cotton has become a symbol of a high quality product and with the extension of irrigation facilities, it has come to be a great money crop. In its early stages, however, the American Civil War probably saved the fate of the Nile fiber by giving its production a new impetus. About one-half the world's supply of long staple cotton comes from this Nile country, but this picture may change in the near future because of the new government policies, competition, and the small price margin given Sakellaridis over the higher yielding Uppers. Also, we must not lose sight of the fact that Egypt is a monocultural country, that is, at the mercy of modern inventions and discoveries which make its position even more precarious. Its fate began with cotton and will probably end with cotton—but time will tell!

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[3] Cotton Production and Marketing in Egypt. Unpublished report of Division 23, Bureau of Foreign and Domestic Commerce, Washington, D.C. July 15, 1935.

[4] P. K. Norris. Cotton Production in Egypt. Technical Bulletin No. 451, pp. 32-33. U. S. Dept. Agr., Washington, D.C. 1934.

cal purposes. They can be adapted to a large variety of physical human, and other phases of geography, and also lend themselve very well to various grade levels. An analysis of the riddles wil show some of their characteristics.

In the first example for mathematical geography, the latitude i designated by the sun. Since the shadows fall southward a part o the time and northward most of the time, the location is definitel between the equator and the Tropic of Cancer. Since armadillas ar found only in the Americas the location must be Mexico or Centra America, and not any tropical location elsewhere.

In the second riddle the limiting factors are (a) two islands o nearly the same size, (b) a January mid-summer, (c) area slightl smaller than Great Britain. The January mid-summer definitel places the country in the southern hemisphere. The facts of ancestr and area now definitely eliminate all countries except New Zealand

The third example is on a juvenile level. It has five limiting factors.

The following examples are intentionally faulty:

D. It is the largest continent in the world. This continent has th most people in the world. Since the answer can be determined b either statement it is not a riddle from an educational standpoint One or two questions would serve the purpose better than a riddle

E. It produces the world's most rubber. An important naval bas is located at the end of the peninsula. The single question "Wha country produces the most rubber?" would serve educational purposes better than the above riddle.

A riddle for geographical purposes therefore, is a type of problem which includes several limiting factors no one of which in itsel betrays the answer. On this basis the geography teacher can easil distinguish the device from other methods. The teacher, cognizan of the psychological background may better determine the utility o riddles and select them for classroom purposes. The geographer who knows the nature of this relatively new device may intelligently create riddles of his own, and even teach students to create them.

INTEREST-STIMULATING DEVICES

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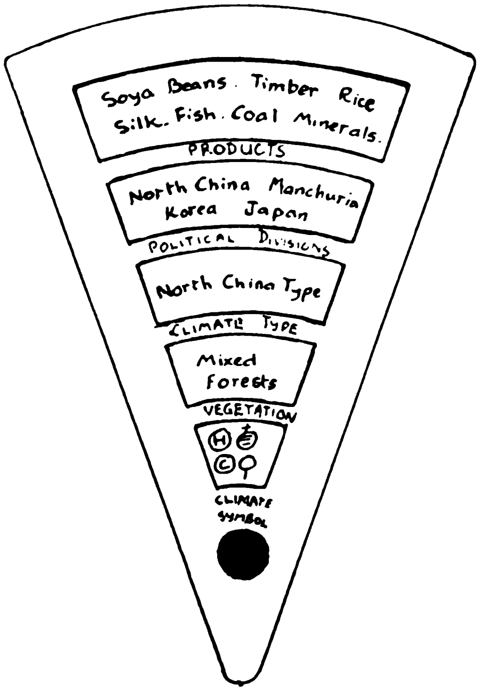
An interest-stimulating device should be of such a character that information appears secondary, the horizon of the pupil being dominated by something in which he is instinctively interested, and which appears to him a worthy end for which to work. The following device demands considerable initial work in assembling sets of related geographical facts, but to pupils this appears secondary to the production of a rotating disc which has the novelty of producing any single set of facts simultaneously, and concealing all other sets. As an example of method, treatment of the Hot Belt is considered.

THE CLIMATIC REGIONS OF EURASIA



Kenneth Warden

The Hot Belt can be divided into three distinct types, Tropical Forest, Savanna, and Desert. A disc of plain paper, radius about three inches, is divided into three equal sectors. In each sector is printed along concentric arcs, information appropriate to each type, for example, the Climate Symbol,[1] Climate Type, Vegetation, Chief Products, and Political Regions. A sector of the same angular dimension, but of slightly smaller radius is cut from a page in the note book, leaving however a small portion at the apex unremoved. The disc is then placed beneath the page and fixed in position by a paper pin at the centre. As the disc is rotated, each sector comes into view. The device has a fairly wide application and is not limited to geography.

Refinements and improvements come with age and ability. Sectors can be suitably colored. The "window" need not be cut away in one piece, but arc-bars left upon which to print the words Climate Symbol, Climate Type, etc., indicating the position occupied by each piece of information in the sector. Appearance is made more attractive by a cellophane window, with border in India ink.

. . . .

A second device on somewhat similar lines is useful to show seasonal position of the sun and changes in wind direction between South East Asia and North Australia.

In the middle of a right-hand page of the note book a map is traced of that part of the world bounded by parallel 45° north and south, and meridians 60° east and 160° east. The Equator and Tropics are marked. The map is then traced thru onto the next page so that there are two identical maps on successive pages. By cutting along the three lines bounding the first map south of the Equator, a flap is produced which can be turned up along the Equator and which exactly conceals the upper half of the first map, at the same time exposing the lower half of the second one. On the underside of the flap, when in its raised position, the upper half of the second map is redrawn, and the two pages gummed together. By raising and lowering the flap, two complete maps of the area are to be seen.

With the flap down, or window closed, the sun is drawn in its January position over Australia, and arrows carefully placed to represent the monsoons of Asia and the northwest monsoons of North Australia. The arrows are repeated in exactly the same positions with the window open, but with the tips on the opposite ends. The sun is moved to its position over the northern Tropic. The wind belts are named on both maps. By printing just above the rectangle enclosing the map "This map shows the Sun's Position and Direction of Winds in"—and the word JANUARY inside the rectangle, the month is concealed when the window is opened, and the word JULY is printed in its place on the flap. The novelty of the device for changing round the month, the sun and the winds, appeals strongly to children, who do not tire of raising and lowering the window. The extra time taken as compared with drawing two simple maps is well repaid by the increased interest, which is so marked that after explanation the four following points can be printed beneath the maps and learned without drudgery:

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[1] See Journal of Geography, 1936, pp. 34-37.

1. Winds always blow from High to Low.
2. Winds deflect to the right in the North Hemisphere and to the left in the South Hemisphere.[1]
3. A Trade Wind which has crossed the Equator and become deflected is called a Monsoon.
4. In Asia the word Monsoon means a Seasonal Wind.

The device is applicable in other ways, for example for the conversion of a Climate Region map into one of Vegetation. A central line across the rectangle enclosing the map marks the position of the flap hinge. This crease is of value in fixing ideas when made to coincide with some significant line such as the Equator, its natural place on maps of Africa treated this way.

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[1] See JOURNAL OF GEOGRAPHY, 1932, pp. 305-307.

EDITORIAL NOTES AND NEWS

An analysis of the types and amounts of cargo carried on the Ohio is found i E. F. Brown's Transportation on the Ohio River Route, appearing in the June, 193 issue of the *Marshall Review*, the new publication of Marshall College, Huntington, W.Va.

DR. HOWARD H. MARTIN, chairman of the department of geography at the University of Washington, received the honorary degree of Doctor of Science from Monmout College at its 81st annual commencement. Dr. Martin is the retiring president of th Association of Pacific Coast Geographers, and also institute geographer on the sta of the Institute of Foreign Affairs.

According to a press release from the U. S. Department of Agriculture, May 1 1934, was the first time that Americans had seen dust blow from the plains near t Rockies far out into the Atlantic. Equally wide spread dust storms have swept t country since that date, suggestive of those blowing out of desert Africa on to Nigeri as well as those that buried villages thousands of years ago in Iraq. In any case, man unwise removal of the natural grass cover appears to have started the trouble.

Those desiring first hand information from specialists in the field of conservati will find eminently helpful articles on soil and water conservation, flood control, pra tices and policies relative to basic land use planning, in the regular monthly issu of *Soil Conservation*, official organ of the Soil Conservation Service, United States D partment of Agriculture, Washington, D.C.

The New York Geographical Association at its May meeting held at Syrac voted to affiliate with the National Council of Geography Teachers. The name a local organization remains unchanged. The past three years, this young and acti organization has been headed by Dr. George Cressey of the Department of Geograp of Syracuse University, the latter serving as host for the meetings. This fall the meeti will be held at the Cortland State Normal School with Dr. A. K. Botts as preside Melvina Svec of the Buffalo State Teachers College is the secretary and histori

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Among the out-of-the-states travellers of whom news has reached the JOURNAL a Dr. H. H. Martin, University of Washington, who spent the summer in the Orie Edith Parker, University of Chicago, at present in Europe; Dr. William E. Haas, Nor western University, in western Canada; Mattie Sue Walker, Commercial High Sch Atlanta, Ga., and Mary Gwen Shaw, State Teachers College, Mankato, Minn., in M ico; Dr. Marguerite Uttley, Iowa State Teachers College, in Guatemala; Dr. Eug Van Cleef of Ohio State University, in Poland; Ovid M. McMillion, State Teachers C lege, Athens, W.Va., in England.

The JOURNAL of GEOGRAPHY

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BARANOWICE, A LANDED ESTATE IN POLISH SILESIA*

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University of Wisconsin

The large landed estate is a prominent feature in several regions of Europe, and the presence of many of these properties in portions of eastern Germany and Poland has a significant effect upon the landscape of the Baltic plain. The landed estate contains many marked items of landscape, and the scene in a region wherein these properties cover a large percentage of the total area is quite in contrast to the scene in regions of peasant holdings. Extensive fields, large woodlands, well-constructed barns, a cluster of worker's homes, and the manor house itself all combine to form a pattern of land occupance that is easily distinguished from that of the small fields, cottages, and barns of the peasant farms. Baranowice, a landed property in Polish Silesia, is representative of this type of feature as it appears in many sections of the northern plain of Europe, from the northeastern portion of Germany thru Poland, East Prussia, and the Baltic states.

SITUATION OF BARANOWICE

The 2082 acre estate known as Baranowice, a name carried not only by the landed property, but by the village as well, is located at the southern edge of the great Silesian industrial district of Poland, nearly at the southwestern corner of the country (Fig. 1). It is near a region of coal and zinc mines, foundries, steel mills, and accompanying manufactural features. Yet the industrial activity, which centers around the city of Katowice, is not a visible landscape feature in the purely rural area at Baranowice. The landed property, however, belongs to the Giesche Company, one of the leading industrial concerns of the nearby region. Baranowice is in the section of Poland that previously belonged to Germany, and is within twenty-five miles of the former common meeting point of Germany, Austria-Hungary, and Russia. The setting of Baranowice is thus in the zone wherein western Europe meets agricultural eastern Europe, and the estate itself, like its neighbors, represents an inheritance from a past manorial Europe near a setting of the present-day industrial and commercial portion of the continent.

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*The writer wishes to acknowledge the aid of Mr. George Sage Brooks and Miss Hortense Brooks of Katowice, Poland, for data and photographs.

Site of Baranowice

The focal point of the estate is the group of buildings which form its core, and from which stretch the fields, pastures, forests, and carp ponds which comprise the lands included within the property boundaries. A rolling plain, set in the humid continental short summer climate at the headwaters of both the Oder and Vistula rivers, and some 900 feet above sea level, is the land surface upon which the cultural features of the estate have been superimposed. The specific site upon this plain that is occupied by the manor house, or "schloss" as it is locally called, is on a slight rise that is a short distance removed from the main road and railroad that pass along one side of the property. The fields of part of the estate, and the small bodies of water at the manor house itself drain northward over this plain to the Oder by way of the Ruda, which practically rises upon the estate, while the forest land, which is some distance removed from the building cluster, drains to the Vistula by way of a small creek.

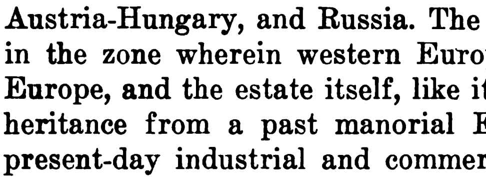

Fig. 1. The situation of Baranowice. The chief industrial districts are shaded

Buildings at Baranowice

A short entry road, which passes a carp pond at the entrance to Baranowice, permits of access to the buildings. These latter are placed in two groupings, separated from one another by a wall, thru which there are several gates (Fig. 2). At one side is the manor house itself, a substantial stone building set at the edge of a park of bout twenty acres (Fig. 3). At the other side, screened from view f the house by the wall, are the clusters of barns, sheds, machine heds, and peasant dwellings, all of which constitute the central oint for the agricultural operations.

The manor house far surpasses the other rural houses of the state both in permanency of materials and method of construction. graveled road, carefully raked, leads from the entry gate to the ront doorstep, where the alighting traveller is protected from rain y a glass canopy that is attached to the building. The park with its aked gravel roads, benches, statuary, bridle paths, closely clipped rass, and 300 year old giant oaks, lies to one side of the manor, nd functions as a place of recreation and retirement for its inabitants.

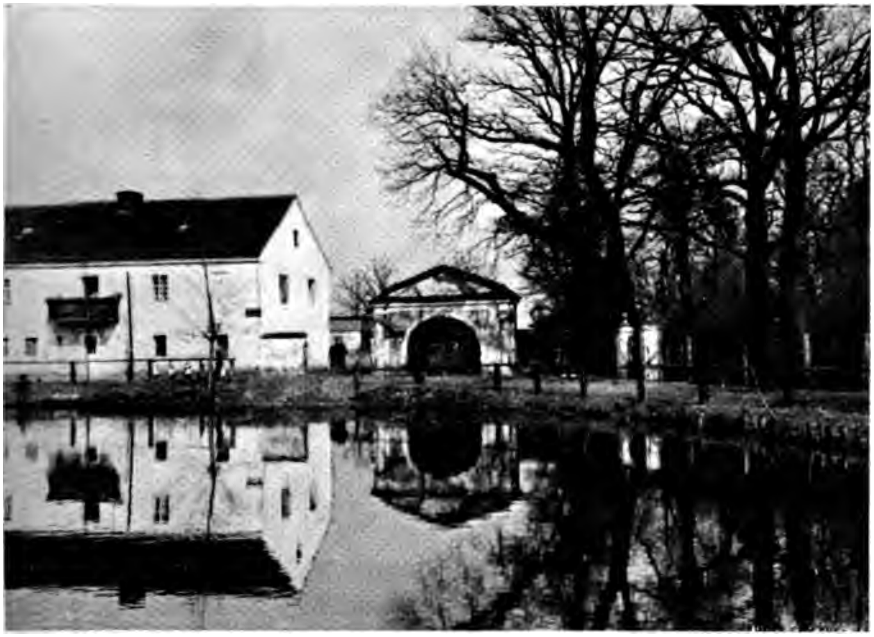

FIG. 2. The entrance to the Baranowice farmyard

The central focal point of the barns and peasant dwellings is a ollow-square courtyard, ample in size for the storage of a dozen r more wagons and other farm vehicles (Fig. 4). Around all four des of the square are white two-story buildings which are the arns, and in part the residences of the estate. Certain segments of ese buildings are devoted to cattle, horses, hogs, and other livetock, while other segments are divided into living quarters, occupied by workers upon the property. Rising above this low building group is a high brick chimney, perched on top of which is the inevitable stork's nest, a landmark for some distance upon the estate, and an omen of importance to the local peasantry.

Several isolated and scattered peasant cottages, belonging to the estate, stand a short distance from the courtyard and along the road or near one of the ponds. These are living quarters owned by Baranowice, and occupied by the deputatists on the property—workers whose pay is received in kind rather than in cash.[1] There are eighteen deputatists engaged by the estate, and a total of thirty-six living quarters in the cottages and farm-yard barns, so some of the laborers who work for cash are permitted to rent estate living quarters not occupied by the deputatists.

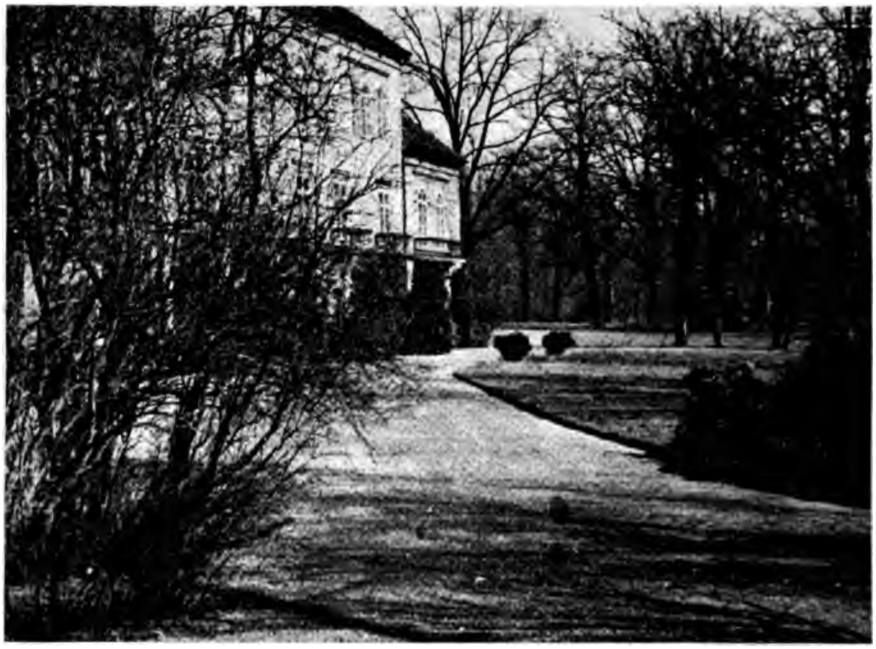

Fig. 3. The house and park

The deputatist engages to work for a minimum of fifteen months, and to provide a woman co-worker to aid him in the agricultural operations. He is entitled to free living quarters, to a plot of a little more than a half acre on which he plants potatoes which are cultivated for him by the farm, to the use of estate vehicles for certain specified functions such as weddings and baptisms, and to pay in kind. This consists per quarter in advance of 1650 pounds of coal, 3 feet of fire wood, 605 pounds of rye for use in his bread, 114 pounds of barley for feed for the pigs and chickens that belong to him rather than to Baranowice, 81 pounds of wheat, and 1650 pounds of potatoes. In addition each deputatist receives a small net cash income per month (about $4.00), which is net pay after invalid and sick insurance have been subtracted.

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[1] German—Das Deputat.

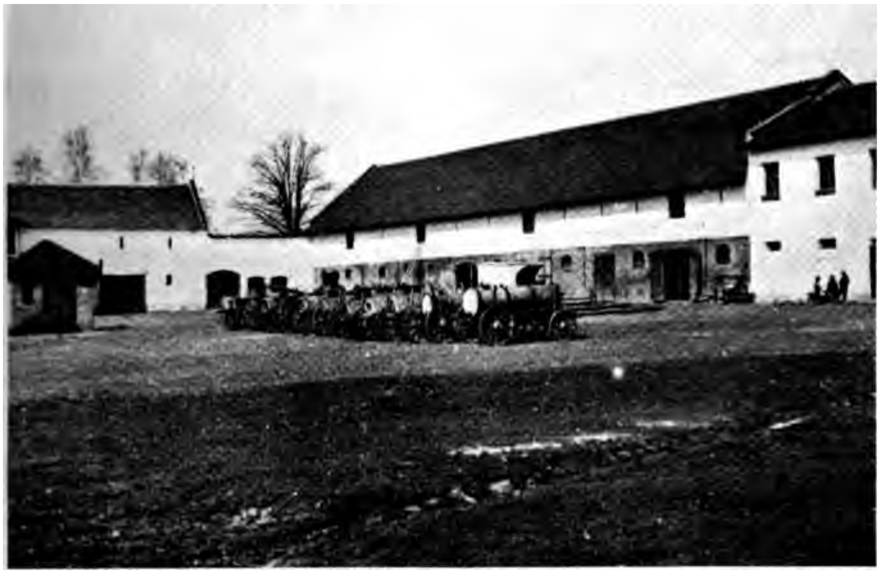

Fig. 4. A corner of the farmyard

LAND USE AT BARANOWICE

Baranowice's 2082 acres are utilized in three different ways—as crop land, meadow and pasture land, and for forests. Five hundred seven acres of arable land, comprising about one quarter of the total acreage, are devoted to eight different crops. Ten per cent of the acreage of Baranowice, 217 acres, is utilized for meadow and pasture, and is grazed upon during the summer season by some of the livestock of the property. The remaining 1358 acres, more than two and one eighth square miles of territory, and two thirds of the total land area of the estate, is a forest land. Thus this large property, below the Polish national average in crop land percentage, far exceeds the average in forest land. The fellow estates likewise tend to depart from averages in similar respects, and thus to provide significant local landscapes that differ from those in regions of peasant land occupance.

THE CROP LAND

The large fields of Baranowice are devoted to eight crop[illegible] usually grown as part of a five year rotation. These, in order [illegible] acreage, are rye, oats, potatoes, barley, wheat, red clover, fee[illegible] mixture, and feed beets. Consequently the estate, with its emphas[illegible] upon rye and potatoes, and associated grain and hay crops, is sample of many others upon the cool Baltic Plain of norther[illegible] Europe, part of the large Rye-Potato Agricultural Region of th[illegible] continent.

Rye is grown on 117 acres, or 23 per cent of the cropped lan[illegible] while oats are raised on 78 acres, over 15 per cent of the arable lan[illegible] and 70 acres of potatoes occupy nearly 14 per cent of the cultivate[illegible] acreage. Together these three crops thus occupy slightly more tha[illegible] half of the crop land, and as such have a significant place in th[illegible] cultural landscape of the area. The remaining crops, whose in[illegible]dividual acreages range from a minimum of 25 acres in the case o[illegible] feed beets to a maximum of 65 in the case of barley, collectivel[illegible] occupy the rest of the cultivated land, and furnish both feed crop[illegible] for use upon the estate, and cash crops for sale in neighborin[illegible] markets.

The grain crops—rye, barley, wheat, oats, and a feed mixture[illegible] are used upon the property in part. After the pay in kind has bee[illegible] computed, and the grain destined for seed, livestock feed, and famil[illegible] consumption has been set aside, the remainder is available for sale. In particular a number of breweries in neighboring districts of Silesia offer a ready market for the barley. Rye, the staple bread grain of Poland, is sold in the industrial regions.

The feeds used upon Baranowice are derived from both the gra[illegible]n crops and from specially grown feed crops, such as the feed beets. These, in conjunction with the hay crops, the potato, and the fe[illegible]d mixtures, are fed to livestock upon the estate, and take the place [illegible]f corn in the American farm economy.

The crops are cared for by the agricultural workers, employed under supervision of an estate manager and his two assistants. T[illegible]e farm inspector supervises all the work, manages the crop sales, a[illegible]d plans the rotation, which for an individual field is normally potato[illegible]s or beets the first year, barley or oats the second, rye the third, r[illegible]d clover the fourth, and wheat the fifth. The clover is seeded with t[illegible]e rye, which thus serves both as a grain crop and a cover crop. In August Baranowice gives employment to 78 people, 31 men and 47 women, as farm laborers. Forty-one of the women are field workers, while six are engaged as milk maids. Seasonal factors are responsible for a decrease in employment in winter, when ordinarily but 29 men and 30 women are on the payroll, and only for a seven hour day as against the 11½ hour day of the summer season.

The humid continental short summer climate of Silesia is responsible for an agricultural calendar upon Baranowice that bears considerable resemblance to that of portions of the northern United States, such as Wisconsin. In April the spring grains—barley and oats—are sown. Potatoes and beets are planted toward the end of the month and into May, at which time the spring sowing is completed. In June the first hay is cut. Late July and early August is the harvest season for grains, the winter rye and wheat harvest commencing about the middle of July. It is followed by the barley and oats harvest. In mid-August the last of the grains have been cut, the second hay crop is gathered, and fall plowing has commenced. By the end of September the winter wheat and winter rye has been sown. This operation is finished by the first of October, when the potatoes and beets are ready for harvest, and the silo must be filled (Fig. 5). Plowing for the seeding of the following spring then continues until frost, when the winter barn work, such as threshing, is pursued. During the winter season the activity in Baranowice, except in the forest, thus centers around the hollow-square courtyard, and the fields bear a continuous cover of moderately deep snow.

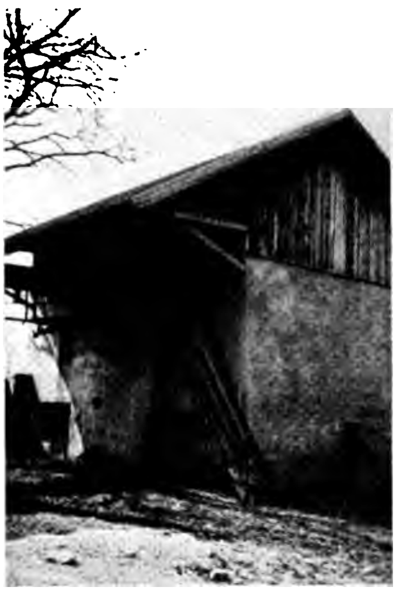

Fig. 5. The silo

Livestock Upon Baranowice

Cattle, horses, swine, and poultry constitute the chief forms of livestock at Baranowice. These belong to the estate, and are housed in the barns that surround the square farm yard. In addition small numbers of poultry, principally chickens and geese, belong to the deputatists, and are kept near their dwellings where such are isolated from the main farmyard. The head herdsman has charge of the dairy livestock, and of the women whose duties are those of milkmaids.

Dairy cattle are of East Frisian stock, the black and white dairy cattle native to the low marshy shores of the Netherlands and northwestern Germany. The estate herd averages 65 milk cows, 3 bulls, and 48 calves, a large herd in numbers when grazing on the meadow and pasture land, but not large in proportion to the cropped acreage or total land area. In 1935 the milk produced by the herd totalled 61,125 gallons, 49,500 gallons or 81 per cent of which was sold, and the remainder of which was used at Baranowice for food for calves, or was given for pay in kind to the deputatists, each of whom receives two quarts a day as part of his recompense.

Twenty-seven working horses, used for the yearly operations upon the estate, are housed in a section of the barns that is separate from the cattle segments.

THE FISH RESOURCES

Carp ponds are common landscape features in Silesia. The carp is native to the streams of the region and is raised upon the landholdings as a fish crop. Baranowice, with three carp ponds, is thus representative also in this markedly regional industry. The estate itself is presumed to have been founded as a landed property by the Bishops of Krakow previous to the eighteenth century, and was extensively used for carp ponds by its owners. Series of dykes were built, these barriers flooding the natural forest meadows, and furnishing ponds wherein the fish were raised. The industry was continued by the French Huguenot family which purchased the property in the early 1700's and continued to own it until 1919.

The ponds may or may not be well cleaned of aquatic vegetation, for the carp is able to exist under environmental conditions that are difficult for other fish. The carp ponds at the estate entrance, however, are carefully tended, since they serve the double function of an entry landscape and of fish-raising. Each year 300 small fish are added for every ten acres of pond. The fish are fed from the beginning of May until the middle of September on blue lupine seeds. In the fall the ponds are drained, and yield about five and a half tons of fish for the Christmas season market. The pond output is thus "crop" or "product" that has been tended during its period of growth, and has been harvested in preparation for a definite market.

Forest Land of Baranowice

A forest land of 1358 acres occupies a nearly continuous block of land that is farthest removed from the site of the manor house, and is well back from the main highway and railroad. In type, the forest is representative of north European plain woodlands, for it is of mixed coniferous and hardwood growth, but dominantly of the former. Red pine and spruce are the chief trees, but admixtures of birch, beech, and oak are important (Fig. 6).

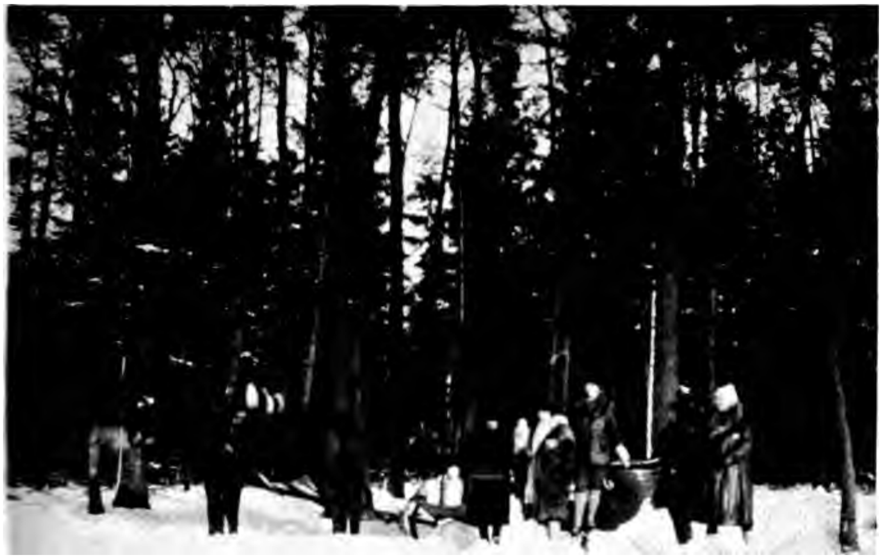

Fig. 6. The mixed woodland at Baranowice in winter

The forest of Baranowice is divided into rectangular blocks by fire lanes and fire ditches. The pattern produced in the woodland as a result of these cultural imprints of man is marked, especially so from the air. A forester and his two assistants, employed by the estate, supervise the care of the woodland and are in charge of all logging operations and fire patrol work, as well as of reforestation. A plan for the latter must be submitted to the Polish government before any timber is cut, and in general logging is limited to mature trees of fifty years of age. Actual cutting is carried on by a crew of woodchoppers, and extraction of the logs from the woods is facilitated by equipment such as railroad spur tracks built to the area from the adjacent main line.

The forest cover of Baranowice also functions in game management. Several species of wild game, native to the woodlands of Silesia, have been preserved in part thru the adequate cover of the landed property forest and in part thru rigid methods of protection and closely controlled hunting. Hunting is in general open only to land owner and guests, and is rather commonly barred to the peasantry. In addition the pattern of grain field, pasture, meadow, and large woodland in juxtaposition furnishes cover and food to a variety of animals and upland game birds that thrive in this combination of landscapes, while ducks are annually attracted to the marshlands and carp ponds during their migrations. Among the different species of wild animal and bird life of Baranowice are the elk, deer, wild swine, fox, badger, Belgian hare, cottontail rabbit, pheasant, mallard duck, partridge, and snipe (Fig. 7).

Fig. 7. At the house after a hunt

The forest land on Baranowice, as on other estates, thus is a critical element of landscape, is itself divided into definite patterns, tering at a remarkably low latitude moved over Southern California bringing copious rain to the coastal lowlands and uncommonly abundant snow to the higher mountain regions (Fig. 1).

Soon after the first of the year a semi-permanent high pressure area settled down over the Great Basin. At the same time temperatures in Salt Lake City, for example, dropped to as low as 16° below zero. Under ordinary circumstances the coastal plain and interior valleys of Southern California are protected from continental winds by the great Sierra Nevada and San Gabriel-San Bernardino Mountain barriers. Cold air crossing these mighty ranges is forced to descend from five to ten thousand feet before it can reach valley settlements; in this way the invading air is adiabatically heated enough to make it relatively harmless. This winter, however, the northern air pushed down by the continental anticyclone was so cold to begin with that, despite the adiabatic heating, the Los Angeles area became thoroly chilled. Such a con-

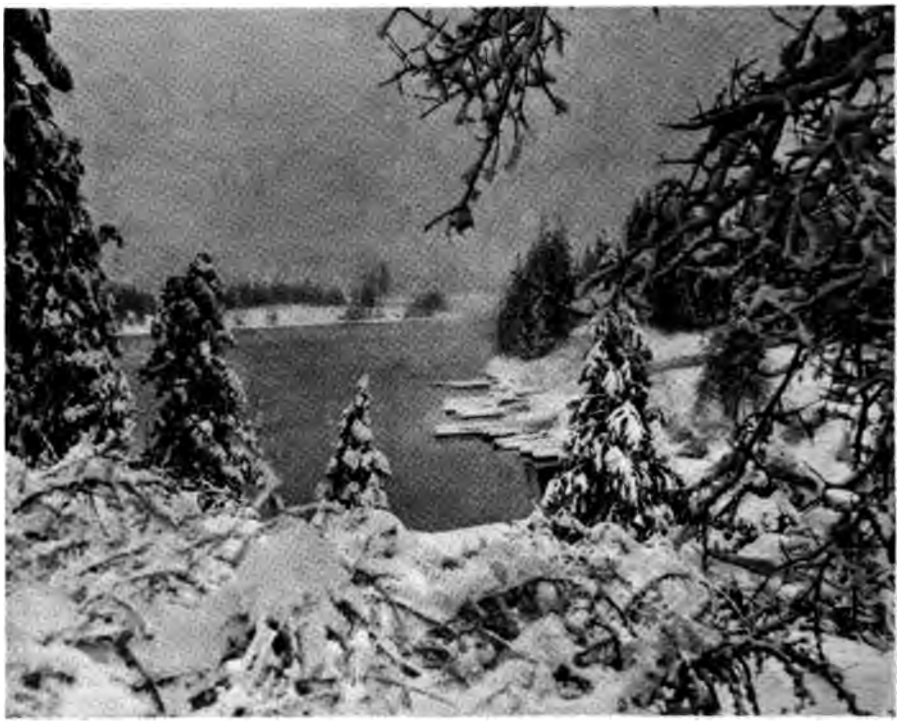

Fig. 1. Lake Arrowhead, popular San Bernardino Mountain resort, after a heavy snow storm. During the winter of 1936-1937 all Southern California mountain areas reported far more than the average amount of snow. Courtesy, Lake Arrowhead Hotel Company.

dition would have been quite bad enough had it lasted only a day or two but, as tho knowing the California urge to have things bigger and better, it continued for about three weeks.

Hazard to Citrus Groves

Probably the most serious effects of the cold wave were experienced in citrus groves planted on the upper parts of piedmont alluvial plains. Year after year air drainage has left thousands of acres of oranges and lemons safe in the thermal belt of the upper piedmont, but in 1937 there was so much cold air in Southern California that it filled the valleys as tho they were giant bathtubs. Current estimates indicate that from 25 to 50 per cent of the $100,000,000 citrus crop has been lost, and that in some places trees have been damaged. Fortunately sap was well out of the trees, so damage in that quarter probably is less than might be expected.

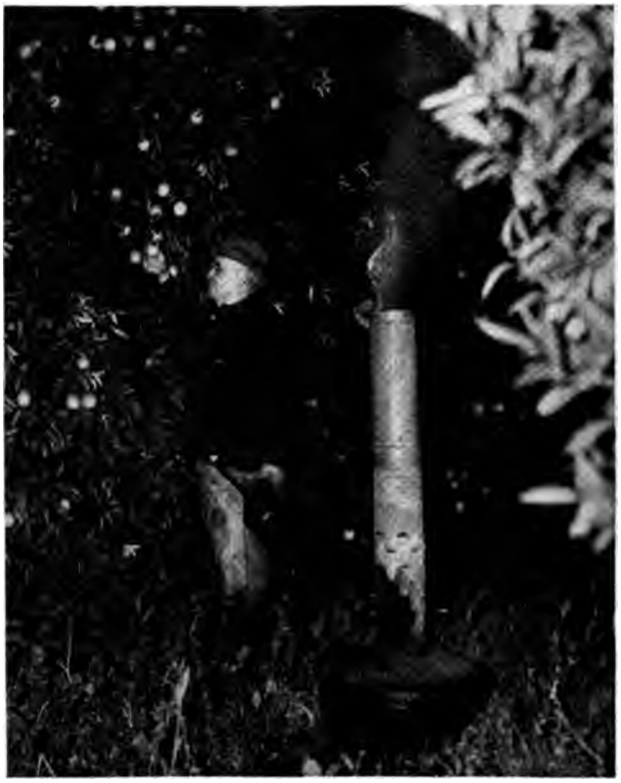

Fig. 2. A citrus rancher inspects the crop on his mature orange trees. This warmly dressed man is wearing high boots for protection against the damp cover-crop raised to add desirable humus to the light piedmont alluvial soils. In his left hand is a special torch used for lighting smudge pots. The orchard heater in the foreground is of modern design with a large reservoir for oil, a tall stack, and a hinged cap to smother the fire when no more heat is required. Courtesy, Los Angeles *Herald and Express.*

Altho the recent freeze is no more serious than those of 1913 and 1922, it is of more interest because this one tested the efficacy of two modern developments—frost warnings and smudge pots. For about a decade frost warnings have been issued every night during the winter by Dr. Floyd Young, special representative of the Weather Bureau stationed at Pomona. Detailed reports from all over the citrus region pour into Pomona so that Dr. Young can make estimates concerning the probable minimum temperatures in every important orange and lemon producing district. These estimates are broadcast at eight o'clock by Hollywood radio station KNX. On doubtful nights most citrus men stay close to a radio, but moving picture theaters commonly flash on their screens the report for their local district. If temperatures below 30° are indicated there is a shuffle and murmur all over the house as whole families hurry home to tend their smudge pots (Fig. 2). This invaluable frostcasting service is supplemented by privately employed riders who cruise up and down checking thermometers strategically placed in the groves themselves.

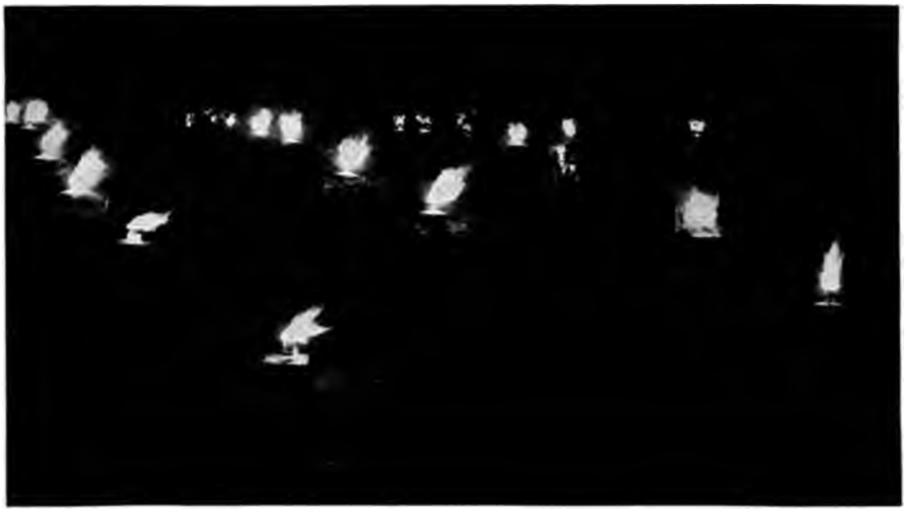

Fig. 3. A battery of smudge pots burning in a young orange grove. Obviously orchard heating on such a scale requires the use of large quantities of fuel per acre. Courtesy, Los Angeles *Herald and Express.*

Several factors account for the localization of this important Weather Bureau office in Pomona. Located close to the center of the Los Angeles Basin, Pomona is well placed to serve as a clearing house for information collected from a wide area. Because of Pomona's average position in the citrus belt local weather conditions commonly are fairly typical both of the coastal and the interior orange producing districts. Then, too, Pomona is headquarters of the old and influential San Antonio Fruit Exchange, one of the strongest advocates for the establishment of a special frost prediction service.

Smudge pots—often called orchard heaters—burning either oil or petroleum coke can raise the temperature of a grove from 4° to 12°, depending on local conditions. After the disaster of 1922 all but foolish optimists equipped their groves with efficient orchard heaters, usually one for every two trees (Fig. 3). This year some 5,000,000 smudge pots were ready for action in the Southern California citrus belt. During the 18 nights of January when smudging was necessary more than 200,000,000 gallons of oil and an unknown quantity of coke were burned by citrus growers. Fruit Exchange estimates show that in the coldest weather, when grove thermometers hovered around 20°, citrus men burned as much as 700,000 barrels of oil worth $1,000,000 in a single night. This is about 50 per cent more than the daily allowable production of crude oil in California. Tending smudge pots on cold nights is dangerous as well as unpleasant. At least two men were killed when their oil soaked clothing caught fire, and dozens of burns were reported in all parts of the citrus region.

Even growers with a good supply of oil found themselves urgently needing more fuel. For days a steady stream of tank cars and loaded trucks poured from Los Angeles refineries into every
ıook and corner of the citrus belt. Frequent attempts were made
o "highjack" trucks of oil by offering drivers a bonus to make an
ntentional mistake in delivering their precious cargo. Those ranch-
rs using pots equipped for coke were in even greater distress be-
ıuse only a limited supply of that new fuel was available. The
nergency led to some highly novel innovations. Hundreds of old
tomobile tires were cut up and burned in smudge pots, much to
e discomfort of passing motorists who thought their brakes were
fire. In Ojai one desperate grower burned dozens of wax candles
ler his trees. Near Indio in the Coachella Valley a fortunate
pefruit rancher remembered that his artesian well water had a
perature of about 100°, so he filled his irrigation ditches to the
ı thus providing circulating hot water to each tree. Fans,
ers, and other freak methods of frost control definitely were
ed ineffective.

ense clouds of greasy, black smoke not only filled the citrus
ut, with the help of offshore winds, managed to blanket Los
es and even the beach cities (Fig. 4). Reports from aviators
te that this artificial cloud reached a maximum depth of

about 5,000 feet. There is reason to believe that smokeless heaters, altho more expensive to install, would be just as efficient in saving fruit and trees. Dr. R. M. Langer, physicist at the California Institute of Technology, recently suggested that smudge probably prolongs cold spells by preventing the sun from warming the eart during the day. All citizens not directly associated with the citru industry vigorously resent the seemingly unnecessary invasion smudge. Los Angeles County Supervisor Legg was so irritat that he proposed to Senator McAdoo that the R.F.C. authorize subsidiary to make available $15,000,000 for the purchase of smok

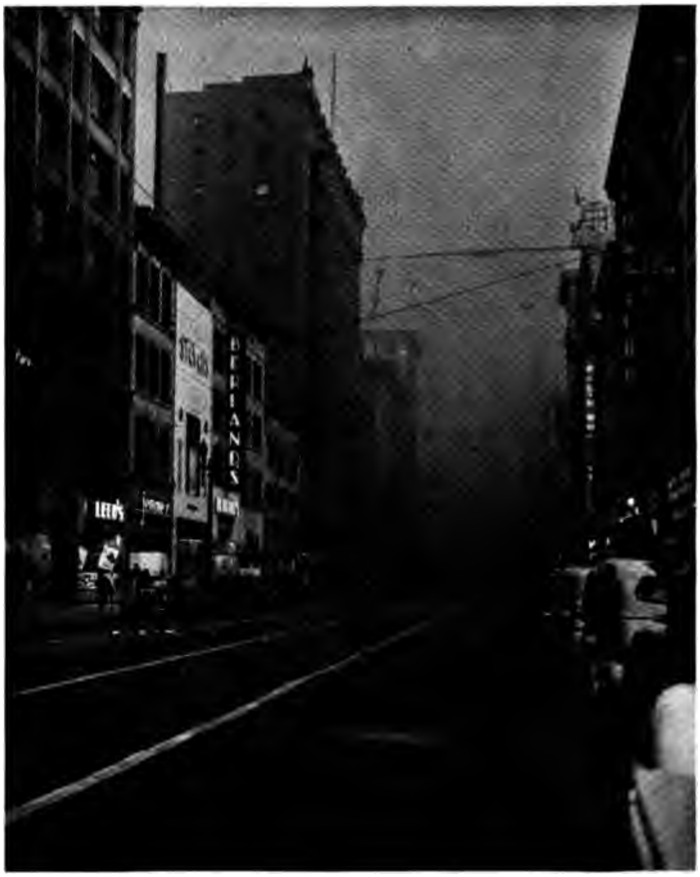

Fig. 4. Looking north on Broadway in downtown Los Angeles. This picture was tak at midday when a pall of smudge was sweeping in from the citrus belt. Attention directed to the light traffic, the few people on the sidewalk, and to the lighted elect signs and show windows. Courtesy, Los Angeles *Herald and Express.*

ess heaters. Unquestionably something will have to be done about this invidious smudge.

OTHER FARM PROBLEMS

Other farmers and ranchers in Southern California also suffered ill effects from the cold snap. Avacados, a very delicate fruit, only lately have become an important California crop. This winter avacado trees planted in spots considered even more frost-free than most of the citrus belt were damaged because of an almost complete lack of orchard heating equipment. Fortunately 27 per cent of the crop had been harvested, but about 70 per cent of the remaining 9,000,000 pounds were lost. Tomato growers managed to avoid much damage by covering the young plants with straw. Spinach, celery, cabbage, cauliflower, and rhubarb producers, however, suffered losses of from 12 to 40 per cent. Poultrymen in Pomona report a 20 per cent reduction in egg production; because of darkness caused by smudge the hens think it is night and spend most of their time roosting.

HEALTH AND GENERAL EFFECTS

The combination of cold and smudge have resulted in a wide variety of general effects on people in all walks of life. According to Dr. Pomeroy, Health Officer, there have been more than 100,000 cases of influenza in Los Angeles County during the month of January. Santa Ana and Pomona schools were closed as a precautionary health measure. At the Riverside County Hospital only emergency operations were permitted because the great quantities of soot and smoke in the air increase an already considerable pneumonia hazard. Thruout Southern California the combination of cold and smudge has been highly unfavorable for persons suffering from respiratory ailments.

Householders have had their problems too. California architecture has real charm, but the construction of ordinary houses is not onducive to comfort during freezing weather. Within the past ecade gas furnaces largely have replaced inadequate floor heaters nd stoves, but even the new furnaces are not enough to compenate for thin walls and countless drafts. On the colder days local esources of natural gas were not sufficient to supply the peak demand for heat, so an old petroleum gas plant, unused for nearly a ecade, was hurriedly pressed into service. Darkness caused by mudge made it necessary to use electric lights extra late in the morning and extra early in the afternoon. All over Southern California, but more especially in the citrus belt, people found that paint, curtains, drapes, clothing, pets, and hair all suffered grievously from day after day contact with oily smudge. Despite the need for clean clothes laundry was almost impossible. A line of snowy linen hung out to dry soon looked like a collection of second hand coal sacks. In Hollywood and other centers remote from actual smudging practically all bananas, poinsettias, and delicate shrubs were killed by frost.

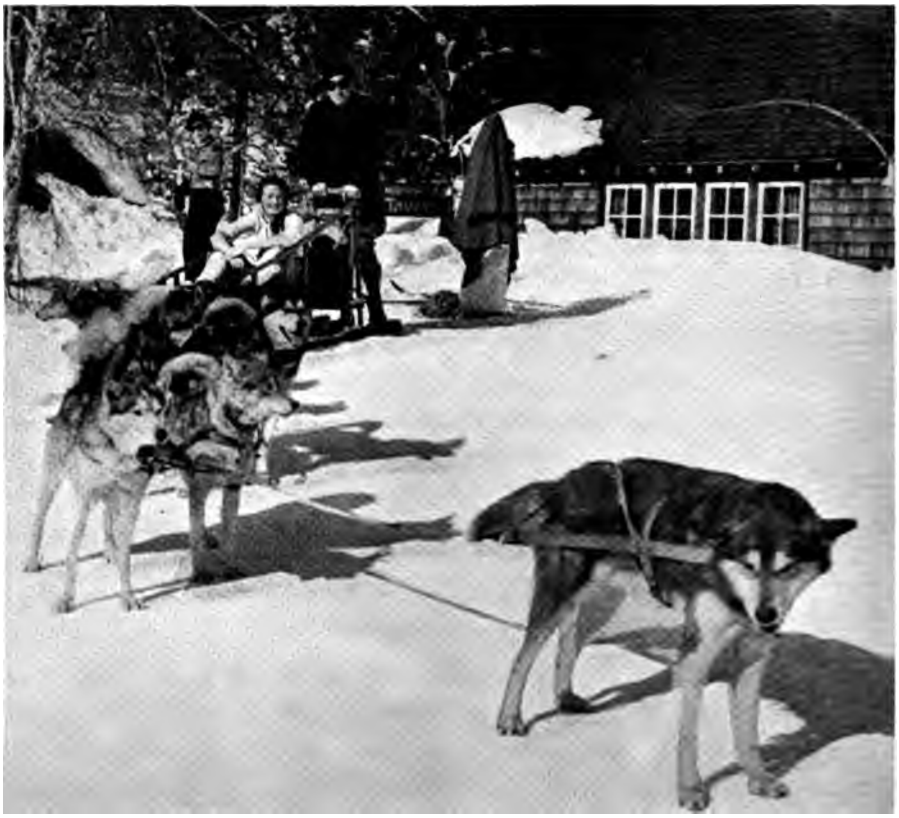

Fig. 5. Deep snow and winter sports at Lake Arrowhead in the San Bernardino Mountains. Notice that snow reaches half way to the eves of the cabin in the background. Such heavy snowfall insures ample irrigation water for valley farmers, but prevents thousands of vacationists from visiting the many mountain winter resorts near Los Angeles. Courtesy Lake Arrowhead Hotel Company.

Merchandising always bears a close relation to weather conditions. As a result of cold, influenza danger, occasional ice on sidewalks, and an unusual traffic hazard caused by clouds of smudge there have been far fewer than the ordinary number of shoppers attending January sales. In certain lines, however, business has been greatly stimulated. Gas and electric heaters, blankets, comforts, gloves, and overcoats have sold like hot cakes. Several stores even have run large advertisements recommending good old fashioned woolen underwear.

RESORT INDUSTRIES

Injury to Southern California's great resort and tourist industry, while impossible to estimate, surely must have been considerable. Weather usually is pleasant, but this region definitely is subtropical, not tropical. Fur coats sometimes are worn by women for comfort as well as style, and the broad blue Pacific is no place for the ordinary mortal to swim during the colder half of the year. This season an unpleasant combination of cold, rain, and smudge has been a source of disappointment to many tourists. Even famous winter resorts at Lake Arrowhead, Big Bear, and elsewhere in the adjacent mountains have not fared so well (Fig. 5). Snow, eight feet deep on the level, in the San Bernardino Mountains blocked roads for days at a time, and has caused several cabins to collapse—sometimes on the occupants. Hundreds of vacationists, including several members of the writer's geography classes, were snowbound at isolated mountain camps without sufficient food or medical supplies.

CONCLUSION

Impartial study shows that California's unusual weather really is unusual. The truth of this statement is demonstrated by the flurry of excitement caused by night temperatures slightly below freezing experienced in certain areas for less than three weeks. Not more than two or three times in a generation does it get cold enough to seriously injure crops, and only once in the history of the Los Angeles Weather Bureau office has there been snow on the city streets. There is ample justification for the boundless pride which Californians, both old and new, have in their State and its climate. Plans were made for a bigger and better National Orange Show to be held as usual in San Bernardino. Marketing organizations point out that while the tonnage of citrus and certain other crops is curtailed, higher prices will help balance the books. One final significant fact should be kept in mind. Southern California no longer depends on the citrus industry to the degree that it did in 1913 and 1922. Within the past decade and a half rapidly growing manufacturing, petroleum, and commercial activities have made this area one of unusual diversification and stability.

A STUDY OF A PERMANENT ALABAMA LUMBER TOWN

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Introduction

Lumbering was a pioneer industry in the South. Forests have been an important economic asset to Southerners for more than three hundred years, the first mill having been established in Virginia in 1722. It and other early mills were adaptions of the old European type mill which used the water wheel for power and a single sash-saw. North Carolina, South Carolina, and Georgia each in turn had their lumber mills to supply home demands and to prepare lumber for export.

Prior to 1870 approximately 85 per cent of the sawmill cut of our country was in the Northeastern states. Then began the rise of the South, and by 1910 it was the leading lumber producing section of the United States. Since then, however, production in the section has been steadily decreasing while it has been steadily increasing in the Northwest.

A question of great importance to Southern laborers, industrialists, and lumber consumers is whether lumbering and allied industries will disappear from the South. In an effort to answer this question for one enterprise a careful study of the Jackson Lumber Company, located at Lockhart, Alabama, was made by the author. He here presents the results of his study.

The Jackson Lumber Company

The Jackson Lumber Company was organized as a part of a Delaware Corporation in 1902. That same year a town site was plotted in south central Alabama near the Florida line on a 120,000 acre tract of land. The site of the town and plant is a level area, well drained by two small streams. The residential sections are the highest portions of the site, and the lowland and small stream to the east of the site furnish a place for a log pond which is used in connection with the plant. The whole town reveals evidence of careful planning as is seen by the map, Fig. 1. The corporation directors from the first were, it seems, interested in the permanency of the company and the comfort of its employees. Such a policy has been maintained rather consistently thruout the history of the company.

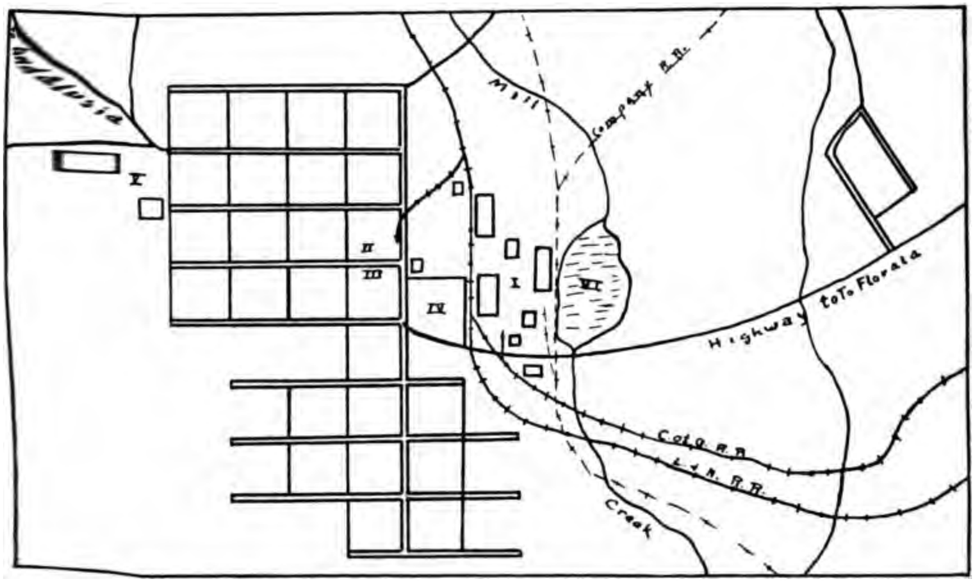

Fig. 1. A sketch map of Lockhart, Alabama, a town founded, owned, and managed by the Jackson Lumber Company. The numbers designate the following places: I. the plant; II. business houses; III. offices of the company; IV. park; V. schools; VI. mill pond.

LOCKHART

Lockhart, the name chosen for the town, is a typically modern town with electric lights, city water, paved streets, and ample recreation facilities. It is served by two railroads, has good highway connections with inland and seacoast towns, and is surrounded by excellent farm land. All dwellings and business houses in the town are owned by the company. The stores are among the most modern to be found in southern Alabama. The general appearance of the town indicates progressive and efficient management. Just recently a large sum of money has been spent for repairs on a remodeling of the company-owned houses.

Living conditions in Lockhart are more favorable on the who than are found now in other mill-towns of the South. The hous are well built, provided with modern conveniences, and rent for very reasonable sum which ranges from $4.50 to $23.00 a mont A garden plot and water are included for this amount. A club hous a recreation hall, and a park have been provided by the compa in order that the leisure time of the employees may be used profi ably. Religious activities are left to the initiative of the vario denominations but the fullest coöperation is given to any religio program.

There is a very harmonious relationship between the races the town. The Negroes who make up about 30 per cent of the pop lation are segregated into a separate section. They have their ow religious and social life in the manner that they see fit. Their se tion of the town differs little, in the way it is planned, from t white residential district. Salaries are paid to laborers with discrimination as to color.

The social status of the families living in the white residenti district of Lockhart compares favorably with that of any oth town of its size, as is seen by the following statistics, which ha been collected by the author.

	Per cent
Homes with bath	40
Homes with electric lights	45
Families with an auto	60
Families with a daily paper	37
Families with a weekly paper	36
Families with a radio	43
Families with a magazine	19
Families with a telephone	5
Average number of books per home	20
Average size of family	5.1

The educational status of the inhabitants of Lockhart is rath low because of the fact that relatively few skilled workers a needed and, too, the families need the additional income that high school student can earn. The garment factories in the near- town of Florala attract many of the girls before graduation a the lumber plant at Lockhart attracts many of the boys. The situ tion is reflected by the facts that only 40 per cent of the pupils w finish the Lockhart junior high school ever graduate from senior high school and not one has ever completed four years in college. The company, nevertheless, supports whole heartedly the county educational program and particularly the big twenty-teacher elementary and junior high school system in the town.

It is, therefore, easy to conclude from the above description that Lockhart is an ideal industrial community in that it is more or less permanent, has a relatively high standard of living, healthful living conditions, and a contented group of employees. The fact that 60 per cent of the employees have been with the company for twelve or more years is evidence that the workers are well treated.

Policies of the Company

The operation of this plant which has a capacity of 75,000 board feet per ten-hour day, has been responsible for over $30,000,000 being put into circulation in the immediate territory since 1902. This is an average of approximately one million dollars a year. At present the company is paying almost a half million dollars a year to its employees in wages. The common laborer is paid twenty-five cents an hour unless he is working under contract. Return from contract labor is not essentially different from that of the day-laborer, tho the amount of work done is greater. The store and office force, excluding the general manager, receive salaries ranging from $48.00 to $350.00 a month. Such a schedule compares favorably with that of any lumber mill in the South.

Further economic security is assured the employees by an industrial insurance which the company carries on all the employees. The policy pays an employee about 50 per cent of his regular salary if he loses time on account of illness or injury. For more serious injuries such as the loss of a limb or an eye, it pays a cash sum that is equal to about one year's wages. Free medical service is rendered to all employees.

The depression was a serious blow to the lumber industry. In 1932 scores of employees were laid off temporarily and many permanently. A plan was devised whereby the unemployed might start farming on the company's land. According to this plan a person might operate a farm and receive all the benefits from it that he would if he owned the land, and also receive every reasonable benefit from the company. More than 4,000 acres of land are utilized in this manner at the present time. "We tried this plan as an experiment,'' said the manager of the company, ''and it has proved hi satisfactory. Our tenants are contented and generally succes It is calculated to help them to become independent and thr and at the same time it works to the advantage of the comp We have five applicants for each of the 110 farms available.''

The average size of the farms is 38 acres. Each one has a supply of wood and pasture space which varies from one-sixt one-tenth of the entire farm. Included on each farm is a well

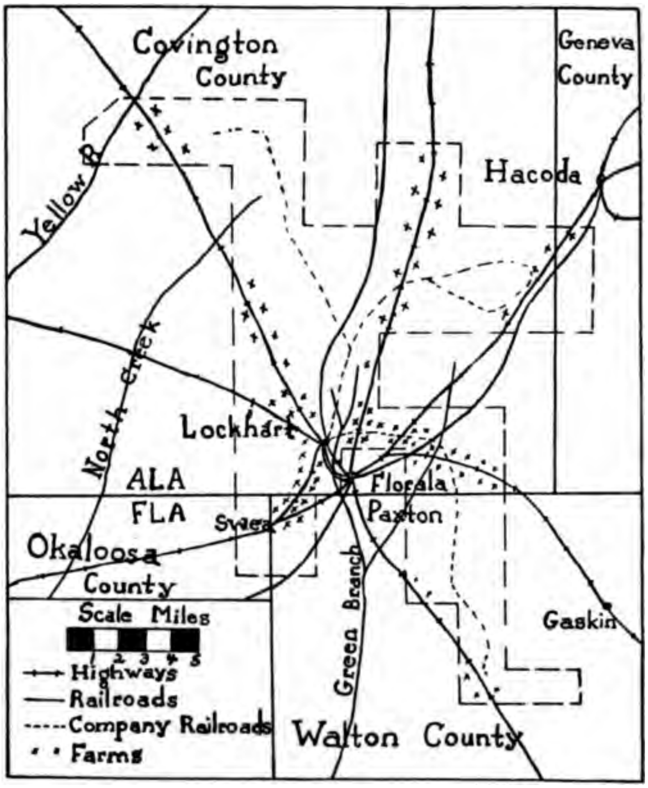

Fig. 2. Map showing the property of the Jackson Lumber Company and th rounding territory. The Company lands are bordered by the broken line.

structed dwelling and a barn. The majority of the farms are veniently located near the town of Lockhart (See Fig. 2).

Source of Lumber

The Jackson Lumber Company has operated on the same for thirty-four years, largely because it has practiced a prog of conservation. If the program is strictly adhered to the plant operate indefinitely. Early in the history of the company a plan was devised and adopted which would allow an annual cut such as would theoretically prevent a depletion of the timber supply. The annual cut was to come from approximately five-sixths of the 120,000 acre tract of land. The remaining 20,000 acres are devoted to farms, pastures, and tung oil plantations. The greater part of the available cut at present is located at a distance of 20 to 35 miles from Lockhart. Much of this timber, that is not readily accessible to the company railroad, is now being cut into lumber by small mills and trucked to the planer where it is prepared for market. Relatively little of the land is difficult to reach.

The lumber being cut, at present, varies from the lowest grade of Southern pine to the highest grade of hardwoods and pine. The prices per thousand feet range from $14.50 for the poorest grade of pine to $36.00 for the best grade of hardwood.

Until recently a very low percentage of the lumber was sold locally. The local sales show a decided increase since 1934, due, it is believed, to a scarcity of small lumber dealers since the partial depletion of the timber supply. The large Southern cities and foreign countries have been the principal markets for the lumber. Huge orders are filled frequently for Italy. Mobile and Pensacola are the principal ports to which the lumber is shipped by rail to be exported.

The forest conservation program also provides for protection against fire, destruction of dead and broken limbs, protection of undergrowth, and the cutting of mature trees only. If fires are kept out of the forests, the natural regrowth of trees is very rapid. Frequently close stands of young trees are thinned, in order to allow the best growth. Fires are kept at a minimum; less than one per cent of the land is burned annually.

Conservation is also practiced at the sawmill. An extremely small part of the log is wasted. The band saws cut an eighth-inch kerf as compared with a five-sixteenth kerf of the circular saws commonly used at small mills. The thicker slabs, instead of being piled aside to rot or be burned, pass thru a series of saws which cut them into lath or moulding. The rougher or more uneven slabs are cut into short blocks and carried on a belt to the fuel room. This waste is sufficient fuel for the boilers and for the homes of the workers.

In addition to conserving its own forests the company officials cooperated with those of other companies in 1923 to get Alabama to take some official action toward the conservation of the forests of the state. It is calculated that the resulting program adopted by the state saved many millions of feet of lumber from destruction and allowed millions more to be grown. There may now be cut in the state 12,000,000,000 feet B.M. annually and still maintain a balance between cut and growth.

The Jackson Lumber Company is, at present, obtaining approximately 35 per cent of its annual cut from private owners within a radius of 75 miles. Due to its contact with big markets, the company is able to pay a more attractive price for the small tracts of timber than are the smaller mill owners.

SUMMARY

The efficient management of the company, its program of forest conservation, and its policy of purchasing from private owners, insures it an indefinite period of operation. The facts that Lockhart has a fairly stable lumber industry assured, will probably be an important center of a tung oil industry, and a farming section, lead one to believe that the town will be permanent and one of the most prosperous in southern Alabama.

VILLAGE LIFE IN KOREA

ANNE C. KIM
Mount Holyoke College

VILLAGE STREET

Thinking back across my twelve years in the United States to my homeland, I am filled with poignant memories and an intense longing for that peaceful land of Korea. I imagine myself strolling down a narrow unpaved street in the village of my childhood. Behind their walls one-story houses are set close together on either side, giving an impression of neighborliness. Vendors, carrying their wares on racks placed on their backs, or on poles across their shoulders, chant their importunities to buy, as they too pass down the street. Here and there I can see a sedan chair, a jinricksha or boys on bicycles. Children, playing in the street in their bright-colored clothes, are shouting and laughing as joyously as the children in any other land. The little girls love to play at housekeeping just as do girls in America. The boys are also as boisterous and mischievous as American boys.

WOMEN

Women and young girls are walking demurely along, some of them carrying a younger brother or sister on their backs. Many have earthern jars of water drawn from the community wells, or hand-woven bamboo or willow baskets on their heads, containing the family laundry. The laundry is done in the little stream that flows down from the hills among which the little village is nestled. Each village has from one to several wells according to its size. It is easy to distinguish between matrons and maids because the latter always wear their hair in heavy braids, which may reach down to their knees. The girls' skirts and short blouses are of practically every hue in the rainbow. The matron, on the other hand, wears her hair up on her head, while her garb is of a more subdued color or often white, which is a universal color for both men and women, tho occasionally one sees a bolder youth appearing in dark western garb.

THE HOME

The woman usually does not appear on the streets except in the early dawn or at dusk, when there are fewer pedestrians. This is due to the old, old custom of keeping her in seclusion, which modern times have not entirely abolished. Woman's place is in the home and even in her own home, she remains in the rear part of the house if her father, brother or husband is entertaining guests in the outer guest-room. The house is of adobe, with a thatched roof if the family is poor, or one of tile if they are well-to-do. The floors are usually the bare earth, beaten until a hard surface is formed. This is then covered with rice-straw mats. The rooms are simply furnished, the most prized piece of furniture being the chest where clothing and linens are kept. Often the chest is beautifully inlaid with mother-of-pearl into intricate and artistic designs. On the papered walls may hang a painted or embroidered panel or two. There are no windows of glass, but instead the light enters thru latticed slides over which are stretched oiled paper.

The kitchen is a sort of a lean-to added to the main part of the house. Food is cooked over a fireplace in iron pots hung over the fire. There are many pots, big ones and little ones. The food is served in brass bowls in the winter and porcelain dishes in the summer. The woman's pride is her collection of brass dishes and utensils. She delights in keeping them bright and shining. The food is eaten on low individual tables of wood, and since there are no chairs, one must sit cross-legged on the floor. Brass or silver spoons with long slender handles and chop sticks of brass, silver or bamboo are used in eating the food which consists of rice, vegetables, fish and occasionally a little meat. The house is heated by the hot air and smoke which passes through flues built under the floors. This heated air comes from the fireplace in the kitchen. Since one sleeps on the floor spread with padded mats, this system of heating is very comfortable indeed. Or to come in on a cold winter day and feel the warmth penetrating stockinged feet (one must take off one's shoes before entering) is a delightful sensation. In exceptionally cold weather a brass or earthern brazier filled with glowing coals is brought into the rooms. These braziers are wonderful for broiling meats.

In the courtyard there is a vegetable garden bordered with flowers such as dahlias, sunflowers, asters and chrysanthemums. Caring for the garden is the woman's task. She does not go out into the fields to toil. Her tasks are concerned with the daily household duties of preparing the food, laundering, sewing and rearing the children.

RELIGION

Since Ancestor-worship is an integral part of our religion, it is important that the family have many sons. The eldest son and his wife and children live with his family. When the father dies, the son becomes the head of the family and must faithfully perform his filial duty of respect in ceremonials on days set aside for this purpose. Each family has its own burial ground which is usually on some hill that has been in the family's possession for many generations.

Besides Ancestor-worship, there is also the Buddhist religion which was brought from India by way of China. The Buddhist temples are built in secluded picturesque spots in the mountains. Many Korean men become monks and go to spend their days in these emples because they wish to escape from the cares and worries of ving in a materialistic world. Second only to Buddhism is a reliion of purely Korean origin, called Chun-Do-Kyo. It is financed i a very effective manner, and constitutes the second richest reliious sect in Korea. Each member sets aside a spoonful of uncooked ce from one meal a day. This is collected and sent either in the ctual product or its equivalent in money to headquarters. Tho a poonful of rice each day from each member is small in itself, when ne considers the total amount collected from about three million members, it is very great. With this income, schools and churches are built, educational magazines and various other projects for the benefit of the general public are carried on. The spirit advocated by the sect is equality and love, in the strictest democratic sense of those words.

THE SCHOOL

After returning to the street, we soon pass an old-fashioned school, called "Suh-tang," from which the chanting sound of the boys (girls are not allowed to attend) reading their lesson in unison, floats out to us. Can you imagine the master sitting in the center of the floor with a dignified manner, and his pupils likewise sitting on the floor around him? The master must always be regarded with the greatest respect by the students. The subject studied is the Chinese classics. These classics include rudiments of mathematics and the sciences, but philosophy predominates. Modern schools have been established only in the large villages. The students of these schools wear uniforms of dark material, and are taught all the modern subjects, including physical education and in some schools even vocational arts.

MARRIAGE

A little farther on, we pass a wedding procession. The bride is riding in a closed sedan chair while the groom is riding on a donkey. Marriage in Korea takes place between a bride and groom who have not had a glimpse of each other up to the time of the ceremony. In fact, one might say until long after the ceremony, because both parties, being shy and self-conscious, would not dare even to take a peek at the other until they are alone. All the arrangements for the marriage are made between the matchmaker and the parents of both bride and groom. The matchmaker is usually a friend of both families. Neither the boy nor the girl has anything to say about the choosing of his mate. After the ceremony, the bride is taken to her husband's home. Considering how these marriages are arranged, it is surprising how large a percentage of them turn out quite happily. Altho at the present time, divorce is more or less reluctantly accepted by society, to obtain a divorce seventeen or eighteen years ago would have been almost a national problem. It was simply unheard of!

AGRICULTURE

At the break of dawn, we can see the farmers starting out for their fields, carrying their implements on their shoulders. The old custom of building the dwellings in a group rather than separately on each farm, probably arose from the necessity for protection against bandits. Proximity to streams and shelter from climatic forces may also have something to do with this custom. Living thus in villages, the farmer perforce must walk daily a distance that varies from a quarter of a mile to two or three miles depending on how fortunate he is in getting a field near the village. Tenant farmers are in the majority. The field is farmed on a share basis, the share being about fifty per cent. Millet and barley are planted on the slopes and poorer soils. However in recent years there has been a tendency to plant tree crops such as mulberry or fruit trees. Paddy-fields occupy the lower lands. Altho the farmer does some irrigating of the crops, by man-power, he is largely dependent on rainfall which luckily has a summer maximum, thus coming at a time when it will benefit the growing plants the most. Since Korea is quite mountainous with no broad level plains to speak of, farming must necessarily be undertaken on a small scale, requiring much hand labor. The use of modern machinery would be impractical.

Strong coöperative spirit among the villagers is demonstrated by the forming of associations, the members of which go together to each other's fields to help sow or harvest when time is pressing. The only stipulation is that the members working in the field be adequately fed by the owner and that he in turn will work willingly when some other member is in need of help.

In the rainy season and during the winter, the farmer does odd jobs such as gathering fuel from the wooded hillsides or weaving baskets, mats or sandals. Such woven articles are taken to market along with other products which the farmer may have for sale.

MARKET DAY

If we visit our Korean village on market day, we are impressed by the noise, the crowds, and the open display of the various products on the side of the street. There is a section where only animals are sold, a section for grains, one for cloth, etc. The loud bickerings in the attempt to strike a good bargain, the shouting by owners of their wares, interspersed with laughter and jokes, can be heard everywhere. Those attending these markets are mostly men as very few women come. Market day is held once every five days. Usually the smaller villages take their wares to the market held in a nearby larger village. One may purchase everything that is needed: oxen, chickens, eggs, dried fish, persimmons, rice, vegetables, lumber or cloth.

OTHER OCCUPATIONS

Continuing our stroll down the village street, we pass a blacksmith shop, wineshops, food shops, tailors' establishments, carpenters' shops, a small paper-making industry, and general stores where everything is sold from farm tools to candy.

From the street we can hear the strains of Korean music coming from some building which perhaps is an inn. We can hear clearly the tones of the different musical instruments such as the harp, the bamboo flute, drum, clarionet, and bugle.

LAUNDERING

As we reach the outskirts of the village we pass a stream where we see a bevy of women washing clothes. They laugh and chatter as they pound the clothes on smooth rocks with wooden paddles. Later when the clothes are dry enough to be ironed, they will be pounded again with wooden clubs until the material is smooth and lustrous. Winter clothing must be taken apart before laundering, the padding of cotton taken out, and when the material has been washed and ironed, the padding is put in again and the whole garment sewed together. Such tasks take up a large part of a woman's time.

CONCLUSION

It is dusk as I turn my footsteps back toward the center of the village. The street is less crowded and less noisy. Most of the villagers are in their homes eating supper. Down the street a postman trudges to his horse or it may be to a bicycle which he rides to the nearby large village. He comes only once in three days. As he fades from view, the picture of that Korean village fades also. I wonder if that village will be the same when I return to Korea? Perhaps the postman will come to deliver and gather mail every day instead of once in three days. Perhaps the streets will be paved. Perhaps every male, including grandfather, will have cut off his hair and discarded his tall horsehair hat. Perhaps the girls are less restricted than they used to be and may go along the streets with more freedom. There may even be motor cars honking incessantly for a right of way! I can hardly wait to see that homeland again. I am sure that tho there may have been changes, I shall recognize my own childhood village.

AN EXPERIMENT IN TEACHING CURRENT GEOGRAPHY

Frances C. Repass
Spearfish, South Dakota

The Problem

The teaching of social studies using a course of study including history, civics, geography, science, and hygiene in the elementary and upper grades has resulted in a surprising deficiency in the knowledge of place geography. Many high and junior high school students have no idea of the location of places mentioned in the current events papers or in their text books. An increasing awareness of this deficiency grew upon me each year I used the social studies course and I tried stressing place geography in the study of places prescribed in our course. The results were not gratifying and high school teachers were still complaining about the lack of geographic knowledge. Then I decided to supplement the social studies course with a course in geography.

Since the pupil's contact with place geography comes largely thru their reading of current events, I decided to have them study the places mentioned in the news. Two divisions of approximately twenty-five seventh grade pupils spent a half hour each day for the entire school year studying these places.

Procedure

The children were provided with sets of maps consisting of one world map and a map of each continent. They were pleased to acquire this new property and to know what we were going to do. I asked them what plan we should follow and they suggested making a list of all places in the news, locating these places, and studying the ones about which there was most news. That plan was followed and the first individual lists were made. Truly they were "wonderfully and fearfully made," too. In addition to the names of actual places, i.e., countries, cities, continents, oceans, and seas we had the following:

English
Germany's
Nobel Prize
Southern states
Duke of Kent

bay
rivers
village
Nazi Party
steamer

Loyalist
French
Columbia University
Cordell Hull

Stalin
Mussolini

I admit I was a bit nonplussed by these lists. The lack of knowledge was more suprizing than I had imagined in my wildest guesses.

Our first lesson was one in English rather than in geography but we finally had a composite list of bona fide places in the news and we proceeded to locate them on the maps of the various continents. The world map was reserved for locating places about which we had studied after we had read the news and located them.

The location proved to be a difficult matter, too, for the majority of the class knew little or nothing about using maps indexed in atlas style. Some actually thought they had to look at each map in the geography. It is my sincere belief that authors of geographies are at fault here for most of them fill their texts with perfectly delightful maps but do not index them. Naturally the child has no guides to give a hint as to even the approximate location. Children learn to use indexed maps very easily and should be given these time savers early in the study of geography. Then the matter of indicating dots, stars, etc., for cities; broken lines for boundaries; and blue lines for rivers was not understood and had to be clarified. Thus, our second lesson was on the interpreting of maps.

Now one lesson on each of the above, did not clear up all the difficulties for all time. "Cordell Hull, Mussolini, Nazi, French, Germany" appeared again and again in subsequent lists for the entire first semester and in the eighth month "Mussolini" cropped up again. Likewise, the use of the indexed map was not practised by all children for they reverted to the old way of "looking at the map" as they called it.

Naturally the first location lessons took much more time than later ones because the children were less adept in using maps and because the later lists were shorter since the same places were frequently mentioned in the news week after week.

After all places had been put on the maps each week we decided upon the place or places about which there was most news and began to glean information from all sources at our command. Reports were given and discussions were held. The news story itself frequently told some historic facts about the place and we investigated those and followed other leads in addition to getting geographic facts about each place. An understanding of why the place made news was gained. For instance, the children undestand that because Poland is not protected by natural barriers and because it has desirable resources it feels it must prepare for war. They appreciated Belgium's attempts at armed neutrality and began to realize how the struggle between two factions in Spain affect all Europe. But emphasis was placed on the location of these places and the juxtaposition of other places.

As I said before, the same places appeared in the news from time to time. This provided splendid opportunities for review. Frequently different cities in countries which we had studied were mentioned as when there arose the necessity of moving the seat of the Spanish government from Madrid to Barcelona or to Valencia. Altho we had learned about these places in our study of Spain, the children were more interested in the location and relative advantages of each over Madrid when the suggested move was made.

We found that the half hour allotted to our study was a very short time but the children did not stop studying at the end of the period. We could not find some places in the atlases and geographies we had at school so the pupils continued the search at home and all places were found eventually.

RESULTS

The results were gratifying. The children liked to use the maps, and most of them took pride in keeping them neat. They were interested in seeing the world map become our "known world" as each place studied was located there. They became more skillful in using all their materials, their vocabularies increased, as did their fund of geographical knowledge and their understanding of world problems became more comprehensive.

JUSTIFICATION

Now perhaps these results might have come from any other approach to the subject so I offer these points in theoretical justification of the course. In the first place, it is interesting and challenging for we study now the thing which is of interest now. I doubt if there be few people in the United States who do not know more about the Ohio-Mississippi River valley now than they have ever known because of the gripping news of the flood disaster last winter. They learned and will retain information about the place because it was of immediate and vital interest. The same thing is true of our study of "Current Geography." Then, too, the fact that all places studied are in the news of the world and are of immediate interest and concern to all people holds the course together and unifies it. We are not just inanely going thru a book nor are we jumping from one corner of the world to another aimlessly.

In the next place there is a definite need for place geography. It is all very well to study regional and physical geography, the cold countries, the hot countries, the cotton belt, the wheat raising belt, etc., but the world designates these as countries, states, or provinces and not as regions and we need to know these political divisions if we are to visualize the relative position of places talked or written about. In our effort to emphasize the social and economic influences of physical geography we seem to have overlooked the fact that after all the very lives and destinies of people are controlled by political divisions now more than at any time in history.

This course enables children to become aware of the changing geography, such as the change of names of Iran for Persia and Ethiopia for Abyssinia. These changes could not be noted if we studied texts alone. Pupils are made conscious of differences in spelling of the same place as "Libia" and "Libya" and the preferred spelling such as "Yujoslavia" not "Jugoslavia." They learn of places not given in geographies as Lae in New Guinea, Kingsman Reef and other landing places for aircraft. This makes our course a changing, growing one, as courses of study should be.

Then lastly, there is one perfectly selfish point. This course keeps "teacher" from getting into too much of a rut for she, too, has to make lists, locate places, find new places and try to keep up-to-date.

ANNUAL MEETING NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

The next meeting of the National Council will be at the University of Michigan, December 27 and 28, 1937. Headquarters will be in the Michigan Union, where all meetings will be held unless otherwise announced. Rooms are available for $2.00 and $3.00 per day single, and for $4.00, $5.00, and $6.00 per day double. Make reservations by writing Mr. S. G. Walz, Manager, Michigan Union, Ann Arbor, Michigan.

All persons interested in geographic education are cordially invited to attend the meetings. This is your opportunity to become acquainted with co-workers in the geographic education field. The following program is tentative. The final program will be available at the time of the first meeting, December 27.

TENTATIVE PROGRAM

Monday, December 27, 10:00 A.M.

Greetings:

Response:

Geography in Education

The Goals of Education and Implications for Teachers of Geography: Dean J. B. Edmonson, School of Education, University of Michigan.

A Philosophy of Geography for the Schools of American Democracy: Roderick Peattie, Ohio State University, Columbus, Ohio.

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Researches Needed in the Teaching of College Geography:

Problems in Teachers Colleges: H. O. Lathrop, State Normal University, Normal, Ill.

Problems in Colleges of Arts and Sciences: Henry F. Becker, Florida State College for Women, Tallahassee, Fla.

Problems in Colleges and Schools of Business: A. J. Wright, Ohio State University, Columbus, Ohio.

Monday, December 27, 8:00 P.M.

Geographic Planning in the Pacific Northwest: O. W. Freeman, Eastern College of Education, Cheney, Wash.

Directors' Meeting

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Researches Needed in the Teaching of High School Geography:

Commercial and Industrial Phases: Thomas Barton, Southern Illinois State Normal University, Carbondale, Ill.

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Tuesday, December 28, 6:30 P.M.

Annual Dinner

Geographic Problems in the Far East: J. E. Orchard, School of Business, Columbia University, New York, N.Y.

Directors' Meeting

THE DETROIT MEETING OF THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS IN COOPERATION WITH THE NATIONAL EDUCATION ASSOCIATION

More than 250 teachers and others interested in geography and geographic education attended the geography sessions of the National Education Association's seventy-fifth annual convention in Detroit, June 28 and 29 and July 1, 1937.

On Monday, June 28, the session was a joint meeting with the Department of Secondary Education of the N.E.A. Archie Gilpin of Detroit presided. Dr. E. E. Lackey, President of our National Council read a paper on "Geography as Related to Secondary Education." Then "Extra Curriculum Activities in Secondary School Geography" was the theme considered in a panel discussion. Major emphasis was placed on the value of field trips and travel clubs. Specific experiences with worthwhile trips and indoor club activities with both junior and senior high school pupils were related in detail.

Listening to and analyzing radio talks, preparing travel and geographical leaflets, planning brief holiday and longer vacation activities, supplementing musical programs with geographical interpretations, creating and presenting activities typical of festivals in other lands were mentioned, but discussion thereof had to be deferred because of insufficient time.

Dr. W. E. M. Aitken, Master, Normal School, Toronto, Canada; Jehiel S. Davis, High School, Van Nuys, California; Edna E. Eisen, State Teachers College, Kent, Ohio; Erma B. Hodgson, Junior College, Bay City, Michigan; R. J. Kehoe, Harper High School, Chicago, Illinois; Zoe A. Thralls, University of Pittsburgh; and Erna Grassmuck Gilland, Consultant in Geographic Education, California, Pennsylvania, as leader, were the participants in this panel.

At the Tuesday, June 29, session Dr. E. E. Lackey presided, and at the Thursday, July 1, session Vivienne S. Worley of the Denver Colorado Public Schools acted as Chairman.

Due to the untiring efforts and enthusiasm of Dr. Bert Hudgins, Wayne University, Detroit, a geography study trip to the Ford factory was made possible for a group of interested teachers.

Speaking from a wealth of experience in conducting tours, Jehiel S. Davis of Van Nuys, California gave helpful suggestions for "Traveling in Europe with Geographic Eyes." He used very attractive pictures from his extensive collection.

Under the thoughtful and competent leadership of Edith P. Parker, University of Chicago, "Essentials in Modern Geographic Education" were analyzed in panel discussion to which also Dr. W. E. M. Aitken of Toronto, Canada, Alice Camerer, Wayne University, Detroit, and R. J. Kehoe, Chicago, Illinois, contributed. The group agreed that the four most essential points in geography teaching are: (1) Giving the pupils a functioning knowledge of the subject, so that they understand its relation to their own and other peoples' living. (2) Requiring the pupils to do more thinking about physical changes in the earth and their relation to geographic facts. (3) Expecting geographic reasons why people in certain parts of the earth eat certain food, live in the kind of houses they do, and work as they do. (4) Teaching pupils to think independently.

Pearl H. Middlebrook, Geography Specialist for Silver Burdett and Co. very effectively pointed out "The Place of Geography in American Cultural Life." She indicated the needs for geographic facts in order to evaluate current events like the Italian-Ethiopian problem, the Arctic development by the Soviet Union and the possibility of another canal from the Caribbean to the Pacific Ocean. She urged that the traveler "see into" rather than merely "look at" the realities presented by the passing landscape. Moreover, when geography is studied in its relation to living, its knowledge increases one's appreciation of literature.

In presenting a delightful review of the "Geography of Current Developments in Palestine," Katheryne Thomas Whittemore, State Teachers College, Buffalo, New York, used beautiful pictures. She analyzed the industrial and other phases of living there.

L. C. Davis of State Teachers College, Indiana, Pennsylvania explained in clear-cut fashion the methods and results of field work carried on by students at that College.

How essential maps and globes are both in homes and schools was demonstrated by Zoe A. Thralls, Pittsburgh, Pennsylvania. Her definiteness added to the practical value of her paper on "Maps and Globes for School and Home."

In considering "Living in the Forest," W. P. Beard, Education Specialist, Forest Service, United States Department of Agriculture, indicated man's relation to the forest. He explained how the uses of forests have changed and so also has man's viewpoint towards forests.

"The National Significance of Soil Conservation and the Geographer's Responsibility" was clearly presented by Dr. Helen M. Strong, Educational Relations, United States Soil Conservation Service. She showed how "the scope of the geographers' investigations includes many of the same principles and problems as those involved in establishing soil conserving practice." An analysis of Soil Erosion in the United States and a consideration of the scientific contributions of the United States Department of Agriculture to conservation followed. Her concluding thought was "geography presents a unique opportunity to develop an intelligent national consciousness not only as to soil conservation but in the whole broad field covering a national policy for wise land use."

ERNA GRASSMUCK GILLAND

EDITORIAL NOTES AND NEWS

The building and marking of the Pacific Crest Trail System which is to stretch from Canada to Mexico is showing marked progress, according to the United States Forest Service. The trail will average more than a mile above sea level and traverses 19 national forests, 5 national parks, and skirts about 75 well-known mountain peaks. Hikers, as well as mounted parties in summer, may tread great forests of fir, cedar, and pine, and by short side trips enter the redwoods. Others may digress from the trail to visit glaciers and scale our highest and most challenging mountain peaks, or descend into the depths of Death Valley. Prospective hikers have no difficulty in reaching the Trail as it is crossed by all our main transcontinental railroads and highways, as well as the Columbia River.

This trail is the counterpart of the famous Appalachian Trail whose terminals are Katahden, Me., and Mt. Oglethorpe, Ga. This 2,050 mile footpath has been completed, marked and measured except for 75 miles in Maine and 40 miles in the Great Smokies where the National Park Service is now building a new trail. Its altitude ranges from slightly above sea level at the Hudson River crossing to more than six thousand feet at Clingman's Dome in the Smokies. At the outset the Appalachian Trail incorporated the existing trail systems of New England and New York, but interested individuals have promoted the trail along with the active hiking clubs. Four guidebooks have been issued covering the trail and the fifth awaits the completion of the Smokies section. In many sections closed or open shelters are available at intervals of a moderate day's journey, say ten miles, particularly true in Maine, New Hampshire, Vermont, and parts of Virginia. Public accommodations are available along many parts of the trail. Some of the route traversed is utter wilderness, past lake and stream and waterfall, over forested hills and mountain crests, crossing intervening plateaus and valleys, with changing zones of birds and other types of animal and plant life. Both trails are not only the background or guide for the nature lover, but sufficiently detached for relief from the pressure and din of our modern economic life.

Dr. Howard H. Martin reports that the third summer meeting of the Association of Pacific Coast Geographers was held in Denver, Colorado, June 23-25, in conjunction with the Centennial meeting of the American Association for the Advancement of Science. The local committee in charge of the three day program consisted of Harold Hoffmeister, University of Colorado, chairman; Margaret Fuller Boos, University of Denver; and Walter Kirkendall, University of Colorado. About thirty geographers and numerous visitors were in attendance during the meetings and twenty-two papers were presented in two morning and one afternoon sessions.

The Wednesday forenoon program was largely devoted to papers on the Rocky Mountain area. The noon luncheon meeting at the Savoy Hotel was featured by an address given by E. Earl Lackey, President of the National Council of Geography Teachers. A short afternoon session was followed by a field excursion around the city of Denver, led by Margaret Fuller Boos.

The Thursday forenoon program included a number of papers on the geography of the Great Plains. Dr. Lackey also gave a demonstration of his map projectoscope. At the Thursday luncheon the retiring president of the Association, Howard H. Martin of the University of Washington, gave an illustrated address on "Colonization and Exploitation in Northern Japan." In the afternoon the geographers joined with a number of other societies in attending the special symposium on soil erosion.

Friday was devoted to a field trip in the Colorado Rockies adjacent to Denver. It was featured by a discussion of the physiography of the Front Range and included visits to mines, milling plants and mining towns in the Idaho Springs and Central City area. Twenty-five geographers made the all-day trip under the leadership of Harold Hoffmeister.

Abstracts of the papers presented, including several papers in full will be available to Association members in the Yearbook to be published in the autumn.

Most of the western geographers find it physically and financially difficult, if not impossible, to attend geography meetings in the East during the brief Christmas holidays. Consequently the new Pacific association with its policy of a summer meeting, usually in conjunction with the Pacific division of the American Association for the Advancement of Science, is filling a very definite need for the geographers of the far West. The secretary's report shows the Association ending the year with an active membership of more than eighty.

Officers of the A.P.C.G. elected for 1937-38 are: President, George W. McBride, University of California at Los Angeles; Vice-President, John Leighly, University of California; Secretary-treasurer, Hallock F. Raup, University of California at Los Angeles; and Editor of the Yearbook, Otis W. Freeman, Eastern Washington College of Education, Cheney. The 1938 meeting will be held in California next June; geographers likely to be in attendance are requested to communicate with the secretary.

The Congrès International De Géographie will be held next summer in Amsterdam, July 18-28. A number of excursions have been planned to precede and follow the sessions, including one to Netherlands Indies.

The Second National Conference on Educational Broadcasting will be held at the Drake Hotel, Chicago, November 29, 30, and December 1, 1937.

A new magazine, *Le Risque,* dedicated to those young enough in spirit to undertake flights and voyages off the beaten paths into the unknown, was launched this summer at Paris, 20, rue Delambre.

A new map of the Pavlof district, Alaska, has recently been reissued by the Geological Survey, prepared in coöperation with the National Geographic Society. The area is of special interest since Mount Pavlof, on July 25, showered the land and sea for a distance of fifty miles, with a thin layer of volcanic ash. The Pavlof district is sparsely populated, but its deep harbors are frequented by fishing fleets after cod and salmon and by the yachts of big game hunters.

According to a recent release from the Department of Agriculture, in some arid regions where pumping water for irrigation has made heavy drafts on underground supplies, the water level has dropped so low that the cost of pumping has become burdensome to farmers. To check this trend, the Bureau of Agricultural Engineering has a number of projects for spreading flood waters over porous soils to help raise the ground water table. An illustration is afforded in the Santa Clara Valley, where the water plane has been lowered more than 100 feet in the last 15 years. Two years ago this district built six detention reservoirs to hold back flood waters so that they may seep underground. The rise in the wells averages about 28 feet.

The 1937 Yearbook of the United States Department of Agriculture, recently off the press, completes the report of the committee on genetics appointed in 1933 by Secretary Wallace. The first report made up the 1936 Yearbook, dealing chiefly with a national as well as international survey of practical breeding and genetic research with the major crop animals and classes of livestock. The present volume covers a varied field, such as garden vegetables, northern tree and bush fruits, citrus fruits, flowers, nut and forest trees, forage grasses, goats, turkeys, ducks, dogs and honeybees. The 1938 Yearbook will deal with soils and the 1939 Yearbook with animal and human nutrition.

In order to help protect the United States from yellow fever all of the flying staff on two airlines between the United States and South America is being vaccinated as rapidly as possible. The anti-yellow fever vaccine is being supplied by the Rockefeller Foundation of New York in cooperation with the laboratory of the Rockefeller Institute of Medical Research in Rio de Janiero. This is in accord with an agreement between the Pan American Sanitary Bureau in Washington, D.C., and the Pan American Airways, Inc., and the Pan American Grace Airways, Inc. Another agreement provides for fumigation of the plane prior to embarkation, and for the filing of a certificate of origin by each passenger embarking at any point north of 30° S. This certificate tells where each passenger has been six days prior to embarkation. Quarantine officers can thus detain a passenger who on arrival is less than six days away from yellow fever regions and hold him under observation until the fever has had time to develop. Similar agreements are expected to be made between the Sanitary Bureau and other international airlines in the western hemisphere.

Soil and Water Conservation in the Northern Great Plains is the title of one of the simplest explained and best illustrated bulletins of the Soil Conservation Service, Region Nine, 1937, United States Department of Agriculture. Each of the seventeen pages has a half page photograph and a narrative description bearing on the photograph, illustrative of the abuses from overgrazing, sod-breaking, faulty plowing, grass and straw burnings, and conservation farming practices by which the devastation may be checked. The pamphlet may be secured at a small price from the Superintendent of Documents, Wsahington, D.C.

Treasure Island, the man-made island reached by causeway from the San Francisco-Oakland Bridge, of which mention was made in the February, 1937, JOURNAL, is about completed. This island was built on a shoal in San Francisco Bay by pumping sand into a seawall enclosure about a mile square. As this island is to be the site of the 1939 Golden Gate International Exposition, no landscaping of grounds can take place until the salt has been leached from the sands. This will be accomplished by soaking the ground with fresh water and then draining off the salt water.

New methods of producing high quality grapefruit juice that will keep its flavor, at least for two years, have made possible the use of off-size and blemished fruit which formerly was largely a loss since it could not compete with the best grades on the fresh fruit market. Thus Texas canners specializing in grapefruit juice have developed a close-to-million dollar industry within the past four years and indications point to further gains.

GEOGRAPHICAL PUBLICATIONS

Harlan H. Barrows and Edith P. Parker. **United States and Canada.** 296 pp., 323 maps and illustrations. $1.44. **Journeys in Distant Lands.** 166 pp., 189 maps and illustrations. $.96. **Europe and Asia.** 280 pp., 255 maps and illustrations. $1.44. Silver Burdett and Co., New York, 1936.

The 1936 edition of the Barrows and Parker geography series improves somewhat the edition of 1927. The statistical material is brought up to date; the new large cities and some of the new railroads are noted on the maps; and the Soviet Union and Manchukuo are given brief but adequate treatment in new units. There are some omissions. The Hankow-Canton railroad is shown as uncompleted altho it was opened for traffic in 1936. The statistical material for all grafs is undated, and the note on the table on page 270 in "Europe and Asia" states that the figures are estimates for some countries but fails to indicate which are the estimates.

The appearance of the books has been improved by using attractively colored covers and darker type. The pictures are easier to read than those in the older edition not only because of the stronger contrasts in light and shade but also because in some of them relationships are shown more clearly.

Some of the study difficulties in the first book have been removed by the use of shorter sentences; by diacritical marking of unusual words; by careful development of new words as they are needed; and by unifying the separate episodes in the story which such devices as "Pretend you hear a man on your steamer telling the story called 'Another kind of Boat.' " (Page 4)

Changing conditions are not sufficiently considered. The importance of cotton manufacturing in the South as contrasted with New England and the use of the all-water route for raw silk from Japan to our eastern cities are cases in point. On the whole, however, the revision has bettered an excellent first edition.

EVA M. WILSON

State Normal College
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Lester E. Klemm, Otis P. Starkey, and Norman F. Hall. **Introductory Economic Geography.** 492 pp. (8½ x 11), 19 plates, 326 illustrations. Harcourt, Brace and Company, New York, 1937. $4.00.

As the authors explain "*Introductory Economic Geography* is designed to furnish the text basis of a college course in economic geography that may not require any college prerequisites."

With the Introductory as Part I, the text contains five parts.

Part II, The Physical Environment, seven chapters (73 pp.), discusses briefly primary physical features. This part provides the student with the physical basis on which he later builds economic facts, concepts and interpretations.

Part III, Foods, Raw Materials, and Fuels, seventeen chapters (164 pp.), touches upon the principal articles of commerce as to their distribution of production and consumption.

Part IV, Commerce and Manufacturing, five chapters (40 pp.), "analyzes the geographic basis of commerce, and the cities and manufacturing that are so intimately related to commerce."

Part V, Regional Geography, sixteen chapters (173 pp.), analyzes world-wide economic geography by regions (usually political countries) and their subdivisions. This part treats economic conditions by regions in detail, integrates the materials previously studied, and by recapitulation emphasizes important points.

The book will stir much interest among teachers and geographers. Some will commend the unusual amount of historical and anthropological material found in it (from this angle it should make a good social science text); others will disagree with the authors in regard to the geographic environment being only physical; students will welcome and benefit by the philosophical treatment of subject matter; and some teachers may lament the better development of agriculture over that of manufacturing and the lack of the over-grown place-name method.

Maps, diagrams, and pictures are excellent. The half-tone plates should stimulate interest both in the book and the geographic relationships they illustrate.

Undoubtedly, *Introductory Economic Geography* is a distinct and valuable contribution to the field of economic geography. An honest attempt to select the best text for an introductory economic geography course commands the examination of this book.

THOMAS F. BARTON

Southern Illinois State Normal University

Howard Ruede. **Sod-House Days, Letters from a Kansas Homesteader, 1877-78.** Edited by John Ise. XII + 248 pages, $2.75. Columbia University Press, 2960 Broadway, New York City.

Pioneering loses some of the glamour which the average American is so prone to attach to it when viewed thru the eyes of one who himself broke the sod. Not that Mr. Ruede, whose letters comprise this volume, was soured on the life of homesteading which he had selected. Rather, in his efforts to picture conditions to the folks back East who planned to join him later, he revealed frontier life as they might expect to find it. When his story is read in this twentieth century the life of the pioneer seems drab, tedious, and physically hard.

Mr. Ruede homesteaded in central Kansas. His letters cover a period extending from spring of 1877, when he left Pennsylvania, to fall of 1878 when he was joined by the rest of his family in Kansas. His diary-like account is matter-of-fact and unembellished. The reader is given a picture of western Kansas as it appeared before the onward march of the agricultural frontier, and is led thru selection of homestead site, construction of sod-house, and other steps by which the pioneer gradually changed this open prairie country into settled area.

Here is a volume that distinctly satisfies the need of one who is seeking a faithful portrayal of pioneering conditions in a portion of our last agricultural frontier. Mr. Ise in finding and editing these letters has rendered the student of American agricultural history a distinct service.

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THE WINE VALLEY OF NORTH PORTUGAL

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For hundreds of miles the Spanish river Duero wanders across the stark upland of Old Castille, but its valley has little that distinguishes it from the surrounding steppe-like country. Just before the Duero becomes the Portuguese Douro, however, it descends into the lower portion of its valley, which it has cut deeply into the plateau. This Portuguese valley, because of its lower altitude and sheltered position, offers environmental conditions in every way different from the bordering uplands, where little else than scrubby pasture and poor fields of rye and potatoes may be found. The valley, producing olives, almonds, and citrus fruits, is a distinct zone of Mediterranean culture. Its specialization is in viticulture, and from its vineyards comes the strong, sweet wine known as Port.

Port is known the world over. Its unique flavor, with its strength and full body, have long made it a favorite dessert wine wherever fine wines are appreciated. It forms an integral part of the Frenchman's aperitif, it cheers the cold Scandinavian winter, and it revives the languid northerner stationed in the tropics. But it is an English drink par excellence. One naturally thinks of Port in terms of its English setting.

Half of the wine exported from Portugal goes to England, and half of the wine-exporting business in Portugal is handled by English firms. This curious trade situation is not solely the result of historical accident or individual enterprise, nor of English progressiveness or Portuguese backwardness. The Port wine trade, which is practically identical with the Portuguese export of wines, started and has continued as a geographic phenomenon.

ORIGIN OF THE TRADE

As early as the fifteenth century Portuguese fishermen, going into northern waters in search of food for an already poor country, generally carried a few casks of wine to be disposed of at points along the British coast. They did this not because they made any presumption to being traders, but because they found that wine readily could be bartered on these northern islands for needed provisions. In time regular trade connections were established, and Portuguese wines grew in favor among the English. Port was a minor competitor on the British market, however, until the beginning of the eighteenth century. At that time political foresight recognized a geographic relationship and intervened in Port's favor.

England was embarked on a manufacturing career long before the Industrial Revolution, and was already organizing its markets. In 1703 it negotiated the Methuen Treaty with Portugal, whereby English manufactured goods were to be favored in purely agricultural Portugal, and Port wines were to be given a preferential tariff in Britain. A logical regional exchange was thus arranged, and because of favored entry the consumption and sale of Port increased greatly. Soon this wine was unrivaled in England, because its quality had become as well recognized as its comparatively low price. English firms entered the business in increasing numbers in poor, little-organized Portugal, and a chain of relationships with yearly greater ramifications was begun.

To this day the bases for the trade have remained sound. Industrial England, unlike manufacturing France and Germany, can produce no wine of its own. In agricultural Portugal manufacturing is still in the primitive stage. Hence the Methuen Treaty is one of the few agreements between nations which after two centuries has not become out-moded.

England is no longer Portugal's only customer for the now famous wine, but a surprisingly large percentage of the total exports go to places where the wine was introduced by English. From the mother country the taste and tradition for Port was carried to all of the widely scattered British colonies and dominions, and from the low latitude colonies it was introduced into other portions of the tropics. Moreover, Port, as a British re-export, entered into its trade with Scandinavian countries as well as with Belgium and Holland. As an article of trade today Port is as much English as it is Portuguese. The Port sold in the United States, for example, comes from London.

THE ENVIRONMENTAL BACKGROUND

The English have had a hand in determining the characteristic features of Port production as well as of Port trade, but the individuality to which the wine's success is due can be traced to environmental conditions. Port is in this respect totally Portuguese, for nowhere else are found identical, or even similar conditions.

Port wine is not produced near Porto, as its name suggests, but in the upper (Alto) Douro Valley. The producing district, now limited by law, is practically coincident with soils which are residual from an easily decomposed Cambrian schist, and vineyards are limited to lower slopes within that district. The westernmost part of the district lies within fifty miles of Porto, and it extends from there without interruption to the Spanish border. All of the principal producing sections are along the banks of the Douro itself, and have always been closely related to transportation on the river. An old saying runs that the true Port grape is grown only within

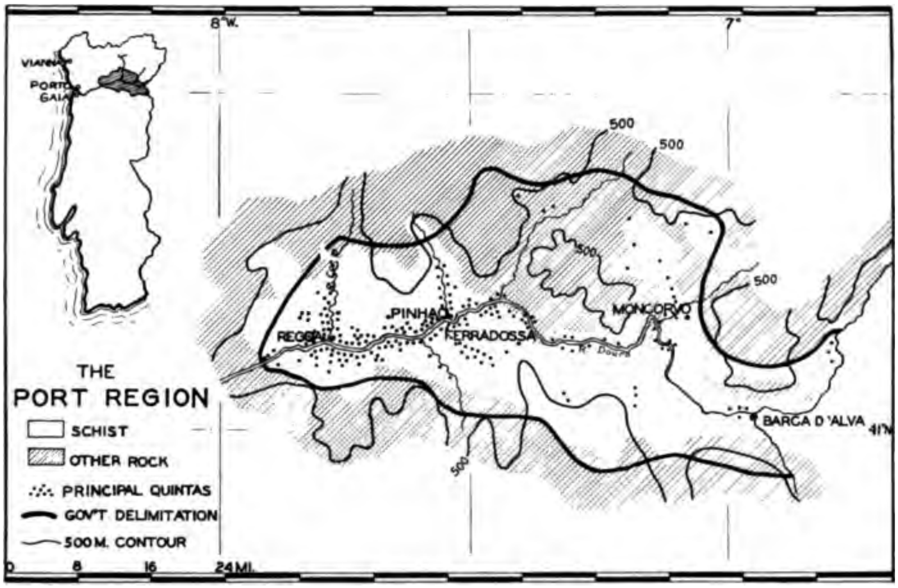

Fig. 1. "Principal quintas" include the properties individually listed on the map of the Douro Region published by the Comissão de Viticultura da Região do Douro, 1932. They usually exceed 25 acres in size and their owners try to manage them more or less scientifically.

The line of governmental delimitation is the one shown on the Comissão de Viticultura map. A detailed survey of the region is now being made for the purpose of delimiting the region even more narrowly, so this boundary will be changed within the next few years.

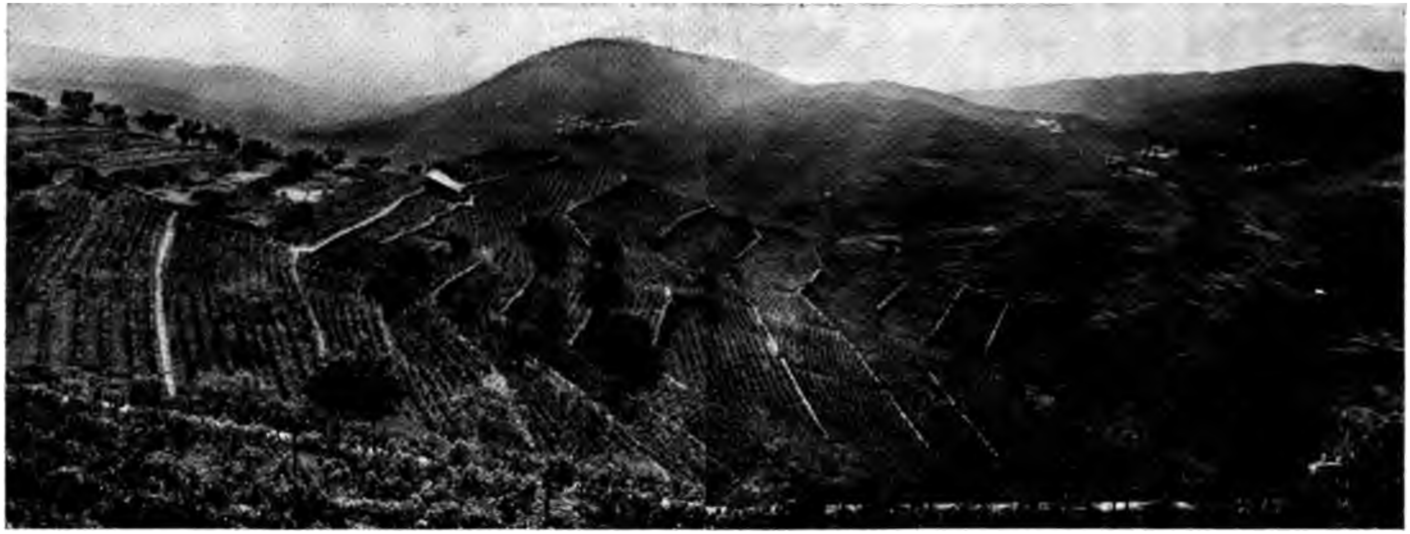

Fig. 2. A landscape in the Regoa region, along the valley of a tributary of the Douro. The elaborate terracing, the almost total absence of crops other than the vine, and the paucity of habitation are typical. Altho the photograph was taken on a sunny summer day, the pervading atmospheric haze is a noticeable feature. Collection of the Instituto do Vinho do Porto

sound of the oars on the Douro. This is well demonstrated by the fact that the eastern limit of the Port region long was situated a short distance above the Ferradosa Rapids, the head of navigation on the Douro until 1820. In that year the rapids were blasted clear, and boats were able to reach the Spanish frontier. Aided by the new stretch of water transportation, and later by the railroad, the Port region was extended during the nineteenth century to Barca d'Alva.

A combination of the schist soil, adequately drained slope, local conditions of humidity and sunshine give a high sugar content to Douro grapes. Soils chemically analogous are found elsewhere, as for instance in sections of Spain and Southern Portugal, but under a drier climate; and steep slopes and the same climate are found within the granitic sections of the Douro valley itself, but there the soil gives an inferior wine. The schist region of the Douro has practically a monopoly on its type of wine, whereas almost every other wine can be imitated with some success.

As in the Bordeaux region, in Champagne, or on the slopes of Vesuvius, all of the three environmental elements which influence the quality of wines are of equal importance in the Alto Douro. But also as in other regions they do not exhibit uniformity over the whole district. One would be greatly mistaken in supposing that every part of the Alto Douro region is planted to vines and produces good wine, or that a given property produces good Port grapes every year.

The soils residual from the Douro schists differ widely in chemical composition, and they differ in tilth according to their position on the slopes. Soils high in potash and low in nitrates and phosphates are the most common, but any one or two of these components may have a comparatively low percentage locally.[1] There are, therefore, recognized permanent differences in the quantity and quality of wine that individual properties, or quintas, will produce. The

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[1] Analyses of two typical Douro soils give the following percentages of component minerals:

Sample Number	2,439	2
Nitrates	0.39% by weight (dry)	0.25%
Phosphates	0.82	0.25
Potash	5.53	8.94
Lime	1.73	2.20
Magnesium	0.51	2.63
Iron and aluminum	91.02	85.73

Samples taken and analyses made by the Instituto do Vinho do Porto, Porto.

buyer of the best wines refuses to consider the product of many quintas within the legal district merely on the basis of the soil which he knows they possess.

This "ill-balanced" soil as a rule yields comparatively few litres of wine to the hectare, so vineyard owners who seek to augment the number of litres they produce must correct their soils for the elements naturally lacking. The age-old impression prevails in the Douro, however, that the addition of any sort of fertilizer causes an unpleasant taste in the wine.[2] The desideratum of the region is not, to use a phrase which Tennyson ignorantly applied to the Douro fruit, "a rich golden grape grown fat on Lusitanian summers," but a miserably small black one, from which only a few drops of juice can be pressed. That the "poorest soil produces the best wine" has become a regional proverb whose truth is recognized not only by the poorest vineyard laborer, but by the most progressive Porto shipper. Thus when a person hopes to establish a vineyard that will produce wine of the first class, he does not select a gentle lower slope of deep loam, but a steep, rocky hillside, where he literally blasts soil out of stone to make beds for his vines. The freshly decomposed fragments of an immature soil, especially one that is high in potash, give the grape a quality that makes a prized wine. Hence the best wines come from the rock slope around Pinhão and Tua, and not from the gentle hillsides of the much more fertile Regoa region.

Altho all growers share the belief that anything added to the natural soil impairs the quality of the wine, there is always a great temptation on their part to fertilize for greater quantity. The ideal vineyard is one in which vines are planted on a stony soil where they spend their life (20 to 30 years) without the addition of fertilizer, and where, before replanting, a rest period of a few years for the soil is allowed. However, few quinta owners possess enough land or capital to conduct their business on such a basis. Chilean nitrates, Algerian phosphates, and specially prepared corrective mixes are thus on the market for the vineyard owner of moderate means. The poorest owners plant and turn in clover, lupine, or potatoes as cheap sources of nitrogen, and everyone carefully uses the small amount of manure that is available. The residue left after the pressing of the grapes also goes back to the soil. The wine-buyer shakes his head at all these practices, but most producers smile when they see three litres of wine where there were two before, and their land in continuous production. But even tho a high percentage of Port comes from vines thus stimulated, famous Ports have never come from properties managed in this manner. It is one of the cases where man has not been able to improve on Nature.

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[2] This belief was crystallized into law during the years of the eighteenth century when the Marquis of Pombal ruled Portugal. Any Douro grower discovered using fertilizer on his property was liable to fine and imprisonment.

Climate is no less important than soil in its effects upon the chemical processes which take place in the formation of grape sugars. Again the Alto Douro is distinguished, for its climate is quite as individual as its soil. The effective shelter of the thousand-foot walls of the Douro valley produces a climate not only different from that of the surrounding highlands, but also different from the rest of Portugal. Winter rains and a summer dry season characterize it, but the summer is not as completely dry as the southern one, and both winter and summer are considerably warmer and drier than on the northern upland or littoral. Grapes thus have time and ample warmth for ripening, and there are occasional summer rains to refresh the foliage and help fill the fruit. There is no need of such extreme measures as plucking the foliage or throwing dust on the clusters to prevent evaporation of precious moisture, as in drier

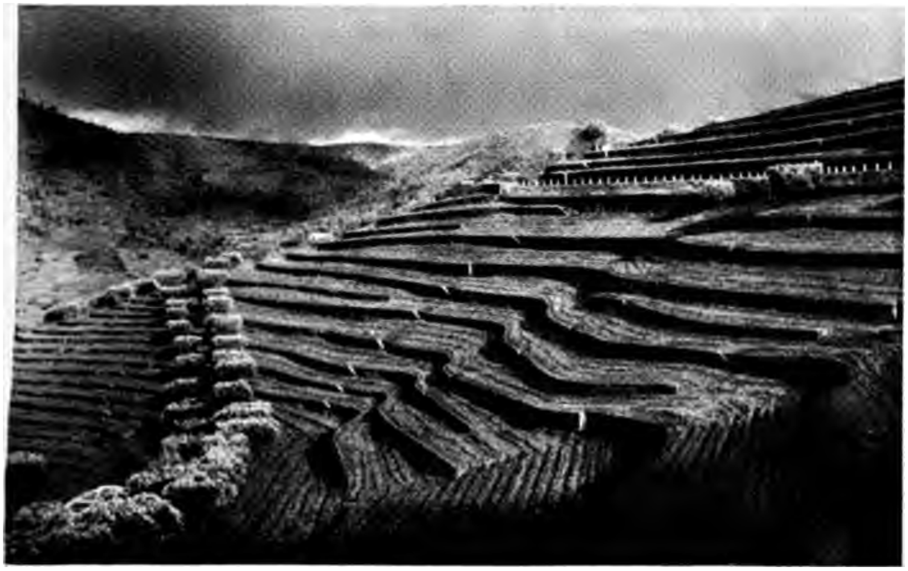

Fig. 3. A well-cared-for vineyard in the vicinity of Pinhão, where the best Ports are produced. The trees in the double row of the left foreground are olives, and they mark a property line in the traditional manner. Collection of the Instituto do Vinho do Porto

parts of the Mediterranean, nor need the Douro inhabitants resort to the production of Vinho Verde, or "green-grape wine," as in Portugal north of the Douro, where because of the cool summer grapes rot before they can ripen. The amount of moisture under average conditions and the quality of the sunlight are ideal for the production of a sweet grape. Typical atmospheric conditions in the vicinity of Regoa bear some resemblance to those of the Bordeaux region in France, where the grapes grown also attain a high sugar content. A typical summer day is hot, but a slight haze often pervades the atmosphere. No day is without sunlight, but the days of continued burning heat which viticulturists fear are rare. Temperatures of over 100°F. are recorded on many summer days because the high valley walls restrict the movement of air. Even a few days of 120° are encountered each year, but one must not assume, as some writers do, a "torrid" summer on the strength of occasional maxima. The diurnal range during summer averages 60°F., and the hours of intense heat per day are few. One sleeps under a blanket at Regoa in July.

Climate varies from east to west in the region, hence wines differ under climatic conditions as well as under those of soil. The extreme western portion of the district is fairly humid, but progressively drier terrain succeeds it on the East.[3] The poorer wines come from the Baixo Corgo,[4] or the humid portion, where there is a little too much rain to produce the best Port grapes. The fruit fills with water and has thus a lower percentage of sugar. The best Port vineyards are found in the intermediately dry region of Pinhão and Tua, where the grapes remain small and sweet, and yet do not dry on the vine.

The differences in humidity are very evident in the practices of cultivation in the two areas. In the vicinity of Pinhão the vines are planted a yard or more from each other, and are pruned rigorously. Every winter a circular trench is dug about the roots of each vine to entice precipitation within the plant's reach. The earth is given two, or even three turnings a season to preserve a mulch, and no inter-

[3] Average annual rainfall:

Serra do Pilar, Porto	44.0 inches
Quinta do Paço, Regoa	36.0
Quinta de Santa Barbara, Pinhão	26.4
Moncorvo	20.3

Observatório Central Meteorológico, Lisbon, Annals of 1934. Papelaria Fernandes, Lisbon, 1935.

[4] "below the Corgo." The Corgo is a tributary of the Douro.

culture is engaged in. Around Regoa practices show little similarity to those of Pinhão. Trenches are seldom dug; the vine is allowed more branch, even tho it is planted closer to another than it would be at Pinhão; one cultivation may do; and cabbages or maize often keep the vines an unhealthful company. Every practice is adjusted to the greater amount of rainful here. More exacting demands on the soil, as well as the heavier rainfall in the Baixo Corgo result in the production of a poorer grape than at Pinhão.

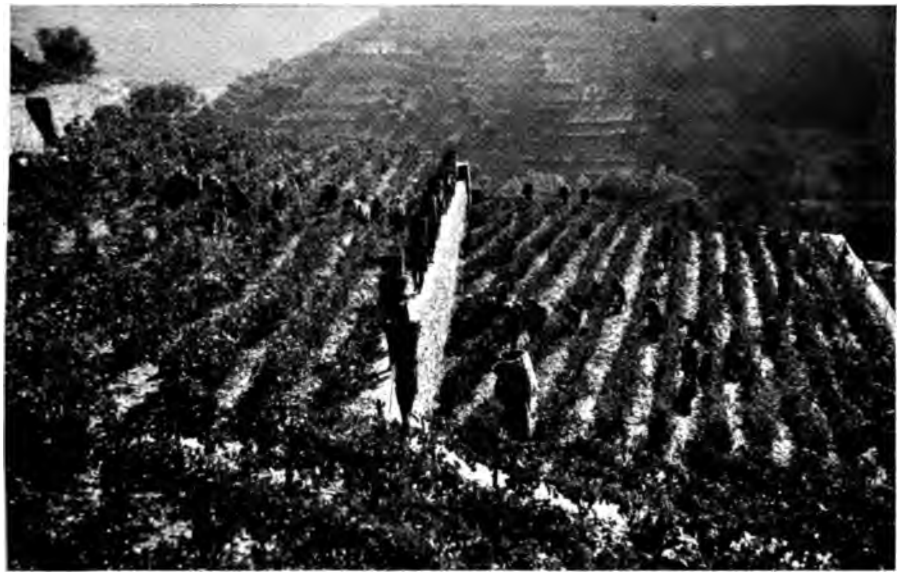

Fig. 4. A vintage scene in the Pinhão region. Most of the workers are uplanders down for the occasion. Women and children gather the clusters, and men transport them to the "lagares," or pressing vats. Musicians traditionally accompany the carriers to lighten their task. Having carried grapes all day, these men will also work all night at tramping, or "pressing" the juice out of the fruit. Collection of the Instituto do Vinho do Porto

A serious problem to the growers in the Douro region comes in the fluctuation of the weather from year to year. One may describe normal conditions, but very seldom is the "normal" approached in any one year, and the range of fluctuation is great. Cold, wet seasons, like the one of 1936, when freezing temperatures ran into June, are likely to succeed hot, dry ones, and vice versa. Or heavy spring storms in an otherwise normal year may strip the vines at the time they are coming into leaf. The probabilities that a given property will produce good wine years in succession are extremely low. There may be, and have been, years without a good wine in the whole region; there are years when only a few properties produce "vintage" material; and there are years when nearly all the good quintas in the region have vintage wines.

The result of this uncertainty is reflected in the peculiar organization of the Douro wine trade. Because production was, from the first, for a far-off market, which in its ignorance of the vicissitudes in vineyard cultivation demanded a wine of always uniform quality, the practice of blending the wines arose. By blending one means that the wines of a poor year are improved by the addition of varying amounts of wines of good years. It is the one very important contribution of the English to the manufacture of Port, and it is in this task that the art of the Porto wine-taster is revealed. It is his job to combine the many wines that go into Ports, and if he is accomplished he can reproduce identically any one of the advertised types of his company from always different base wines. In a way he overcomes the difficulties of an environment, for he makes saleable certain wines that otherwise would find little market where they are sent.

Fluctuation in the quality of wines further influences the land tenure in the region. The large shippers, contrary to their habit in other wine regions, prefer not to undertake vineyard management, but confine their activities to preparation and sale alone. During bad years or good they are not committed to take care of a given property, but they may buy where they wish, and thus maintain their types as closely as possible. A few of the companies own quintas, but rather than have one large property they have several —located in different parts of the region. If they have chosen varied enough exposures they are thus insured against a complete set of poor wines. But the bulk are small properties of individual ownership, each man taking a risk on his year. In a good one he may "clean up," with his wine at $75.00 a cask, and in the more frequent poor years, when his wine sells at a tenth of that, he may make enough to live on.

Slope, thru its two functions, exposure and drainage, is intimately associated with climate in its effects upon the quality of the Port grape. All of the cultivated part of the Douro region is in slope, an ideal condition for any wine country, because vines demand a quick, efficient drainage for their best development. The slopes are generally steep, so every hillside is terraced—the width of the terrace and the height of its wall varying according to the pitch of the slope. These terraces are obviously necessary constructions which serve three purposes: first, they keep the bit of flaky soil cover from creeping downhill; second, they catch and make effective use of the precipitation that falls; and third, they keep the water-table at a constant depth.[5] Terracing, however, will not make everywhere a prized vineyard. The terrain near the river has so gentle a slope and so high a water table that terracing is impracticable, while the upper slopes or hilltops suffer from too effective drainage. Port grapes thus come only from the middle sections of the slopes within the vine region. The Portuguese government, anxious to protect a profitable industry, has recognized this fact so far as to promulgate a law prohibiting anyone to label as Port, wine taken from grapes grown below 70 meters or above 500 meters above sea level. One questions the advisability of applying so rigid a classification over so large and so varied a region, but the law points out eloquently the axiom that all the good wine comes from the middle slopes.

Exposure in part compensates for the variability of the climate, for accordingly as they are situated grapes may be perfect or near failures in a given season. Somewhat over half the region has south-facing slopes, and somewhat less than half looks northward. During the first few decades of Port production cultivators felt that the vine was fitted best to a southern exposure in the region, so they limited planting to the northern banks of the river. When the demand for Port grew, however, and the more promising portions of the northern bank were occupied, hardy newcomers experimented on the southern bank. When finally in one of the "dry" years it was recognized that the wine from the south bank was finer than that of the north bank the tabu was dispelled. Ever since the north and south bank vineyards have alternated in the production of the best wines of the year. In reality it is not a simple matter of south or north facing slope, but also to what degree the slope may be facing east or west of the dominant alignment. For each quinta on the Port slopes there is a special type of weather best suited to its exposure. That the optimum weather conditions do not occur every year, or even every other year, is obvious. The vineyard planter picks his number and hopes that the wheel will favor him, but like other gamblers, he more often takes a consolation than the grand prix.

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[5] The old "national" vine, which was the one planted almost exclusively before the phylloxera epidemic in Europe, was especially well adapted to terrace cultivation. Its roots grew straight downward and had few feeders. It thus reached the water table and the zone of fresh rock, and altho it fed slowly, it was always taking nourishment.

The phylloxera years were followed by the planting of California vines, which today form the predominate stock. The roots of these vines spread close to the surface, and do not attain any depth. Their tendency is to feed the grape by spurts, and not in the steady fashion of the old vine. Adjustment to drainage is thus not as perfect as it once was, and many say that no really excellent wine has been produced since 1878, when the phylloxera came.

Another effect of the introduction of the California vine has been an increased use of fertilizers. This plant in health demands more of the minor minerals composing the Douro soil than the old vine did. The phylloxera thus has been among the agents helping to break down the dictum about fertilizers.

ORGANIZATION OF THE INDUSTRY

The production of Port of average quality is a time-consuming and labor-absorbing process. From the moment when a vineyard is first planned to the time when the bottle or cask leaves the Gaia warehouse, the demands upon manual labor are great. One hardly can accuse the industry of backward technique, for if any shortcuts were attempted the wine produced would not be Port. The construction and maintenance of the thousands of terraces on the steep hillsides is obviously a task for hand work, but even in the cultivation there is no substitute. Every terrace must be prepared, fertilized, and cultivated by hand, and every plant must be pruned and sprayed. The ripe grapes must be picked by hand, and transported on human heads to the vats during the vintage, and even the pressing cannot be done mechanically. The juice must be pressed out in the ancient manner of tramping by foot, because a mechanical press, by breaking the seeds, adds too large a quantity of tannin to the wine.

If one adds the work that is represented in the ten years of tasting, blending, and correction that it takes to produce a mediocre Port, or in the twenty-five to thirty that a good Port requires, and the interest on the investment over the period of aging, a litre of Port should be fairly expensive. If one calculated in North American or even in North European standards, the price would be prohibitive to all but a few.

One of Port's early advantages, however, was the low price at which it could be set down in its market. But at that time not so much care was given to the wine's preparation as now, and the Douro gave cheap transportation that could not be matched by other specialized districts. Nevertheless the low original price of the wine has continued to the present day because of the low cost of its ingredients. The reasons are several, but chief among them are the extreme cheapness of labor and the tendency of the region to overproduce.

Altho the English and other subsequently acquired markets have been admirably developed, there never has been, for a heavy wine of the Port type, quite market enough to absorb all that might be produced in the Port region. Many practicable vineyard locations to this day are vacant, and so former vineyards stand completely abandoned.[6]

Portugal has many regions where wine is produced, but a relatively limited national consumption. Wine is literally cheaper than good water. Consequently, whenever there was any possibility of profit, vineyard entrepreneurs were lured into the Port region and Douro wines tended to approach other Portuguese wines in their low prices.

In addition few alternatives exist for the quinta owner who finds the price offered for his wine consistently below the point where he can make a decent profit. Olives, almonds, figs, and wheat are other crops adapted to the climatic conditions. Wheat on such terrain would be ridiculous even in Portugal, and almonds and figs are now no more profitable than the vine itself. In the last few years olive groves in the eastern parts of the region have yielded much better returns than vineyards, but olive trees take some thirty years to come into full bearing so they are beyond the means of the average landowner in the region. Everyone feels that olive plantings are made for the next generation, and refers to olives as a "rich man's crop." Hence they are limited to the property lines where they were planted long ago as boundary markers, and every man wishes he had more.

Small holders, as elsewhere in Portugal, are tempted to get the utmost out of their soil and provide themselves with an alternative in interculture, especially that of maize. But what is an apparent gain is always a loss, for the quality of the wine is unfailingly inferior under such conditions.

A few bottoms unsuited to vines become vegetable gardens, and a few orange and loquat trees grow in favored spots, but elsewhere, on lower, upper and middle slopes alike, vines are the only cultivation. The Douro is a one-crop region par-excellence not only because the vine is so well suited to the environment, but because other possible undertakings are by nature more risky than grape culture.

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[6] For one reason or another some owners never replanted after the phylloxera had destroyed their vines.

Thus there is little flexibility in production, and without flexibility the return over a period of years is likely to be low.

The owner in the Port zone hopes for a vintage year to bring up his average, but the man who is located too high or too low on the slopes cannot even look forward to that. He relies upon a small yearly return from the sale of his wine for the manufacture of "aguardente," or brandy, which is used liberally in the preparation of Port, or he makes "Douro Claret," which is held in ill repute locally as well as abroad. Brandy manufacture is a regional adaptation to the demand of Port,[7] but the market has been highly competitive, because much other Portuguese wine is also good for nothing but the distillation of brandy, and any brandy can be used in Port making. The profit made by non-Port growers of the region is about the same as that made on a similar enterprise anywhere in Portugal, and the other ingredient of the wine is thus provided at a low price. The fact that growers who can produce nothing but aguardente persist on the Douro, shows how unchangeable is the vine tradition in the region.

If the present profit of the grower is small, the share of labor is even smaller. Altho it is used liberally and exactingly there always has been an unfailing supply at ridiculously meagre wages. Like the entrepeneur, the Portuguese laborer has to consider the competition of all his compatriots. In a land where every-day bread and rice and a weekly portion of fish are the fare, and where peasants in shoes are a rarity, the wage cannot be high. The laborer who has a year-round job in the district earns six to eight escudos (25 to 35 cents) a day. (And the eight-hour day has not yet been heard of in rural Portugal!) Seasonal laborers accept even less. The neighboring province of Beira and Tras-os-Montes, among the poorest districts in poor Portugal, send down eager hordes during vintage or cultivating time. When, a few years ago, the scale of the Galician was even lower than that of the Minhoto or Beiran, seasonal labor came across from Spain. The cheapest hands to be had always seem to appear in the Port district.

The lot of the laborer also might be a better one if there were any other activity in the immediate region to give scale. But the proletarian opportunities in the Douro region are limited to that of cultivating the vines and loading the wine into the little boats that go westward on the river. Every cask goes directly down the Douro from the quinta to Vila Nova de Gaia, where most of the elaborate treatment of the wine is done. All of the warehousing activity, the preparation for foreign shipment, the manufacture of barrels, and such activities take place at Gaia and Porto. The towns of the region, because of their atrophied functions, are little more than villages. They harbor no industry, and have a minimal relation to the quintas. The opportunities for a worker are thus exceedingly limited in the region itself, and his remuneration suffers from local as well as more remote influences.

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[7] Port contains about five parts Douro wine and one part aguardente. The brandy originally was added to enable the wine to carry in shipment, but now it serves the triple function of strengthening it, permitting it to be carried, and arresting fermentation (to preserve the wine's natural sweetness).

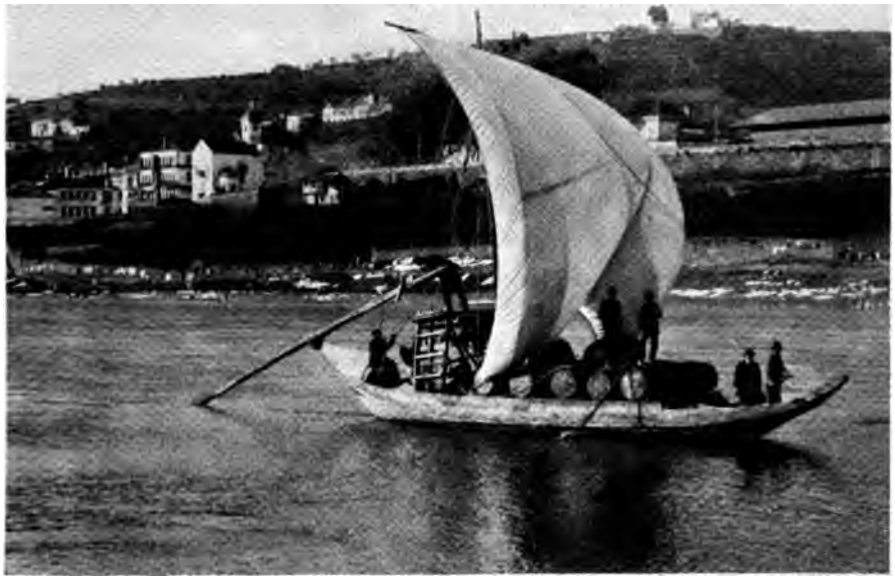

Fig. 5. A loaded "rabelo" bound upstream on the Douro. The long tiller is essential in navigating rapids when the boat is going downstream, for a quick response to its rudder often saves a boat from going on the rocks. When the wind fails on an upstream trip all of the numerous crew are needed to tow the load. Collection of the Instituto do Vinho Porto

The one remaining factor in the low price of Port is that of transportation. Since the 1880's a railroad has run the length of the Douro valley, so the picturesque sailboats no longer have a monopoly on the trade. But they still exist. In fact one may see tens of the oriental-looking "rabelos" pass Regoa every day, laboring upstream against the stiff current, or gliding swiftly down. The railroad has not been able to improve upon the rates offered by the boats, so the two now share the trade. Quintas located on the railroad's side of the river habitually use rail shipment, and those across the river use boats all the way to Gaia in preference to ferrying, then transshipping to rail.

The rabelos have remained a commercial proposition for two reasons; first, because of the low wages of the men needed to operate them; second, because natural conditions enable them to make quick trips without the use of auxiliary power. During winter and spring, when shipments of new wine are made downstream, the river is high, the current strong, and the wind from the east, so loaded boats soon reach their destination. During the summer months, when the current is slack, and when west winds blow frequently into the lows of the Spanish Meseta, the heavier loads (return casks) are carried

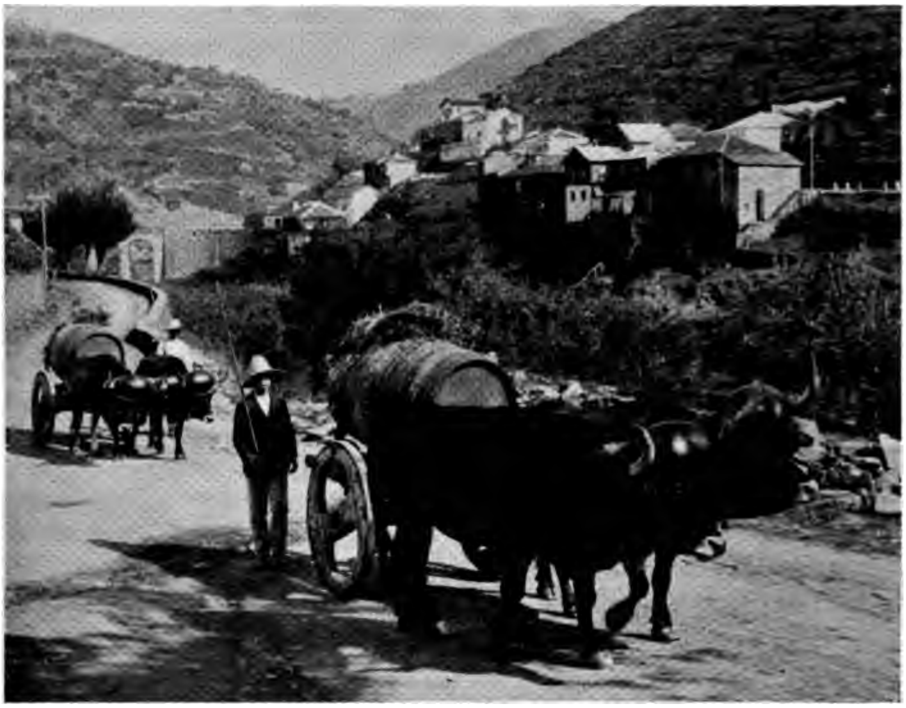

Fig. 6. Casks of wine on the way to a river landing. The common method of local transportation in the Douro is by ox-cart. The strange head-pieces take the place of the "cangas" or yokes which are used elsewhere in Portugal, because in this hilly region a yoke about the neck of the animals would choke them. With the head-piece the thrust of the load is placed entirely on the horns. Collection of the Instituto do Vinho do Porto

upstream under sail.[8] When the winds fail the crews take to the towpaths constructed along the stream, for next to the wind men are the cheapest method of locomotion.

Somewhat less than half the wine shipped goes on the river, but the quantity is large enough so that one correctly may assume that river navigation has kept shipping rates low.

The importance of the low cost of production cannot be exaggerated. The fact that Port firms, because of low wages, small profits, and cheap transportation rates, can buy their wines at comparatively low prices becomes a cumulative advantage. The investment is low, and the carrying cost of interest over the long period that the wine must be stored and treated is also low. When his product is finally ready for sale the Porto shipper is in a position where he could undersell any possible foreign imitator, even if it were found that Douro wines could be successfully reproduced elsewhere, as for instance in California. As it is he is able to compete favorably in the broader market for all fortified wines, and he undoubtedly takes a share of that trade that would not be his under different circumstances.

THE OUTLOOK IS NOT BRIGHT

With all of their present advantages, however, the commercial prospects of the Porto shippers are not very encouraging. They have not been good during the decade. Wine is a luxury in any but its most crude forms, and as such it suffers not only increased taxation but decreased consumption in times of economic stress. Thus in recent years the Porto firms have seen prices mount with no benefit to them, for they have been absorbed in foreign and domestic liquor taxes, in tariffs, and in Portuguese taxes on industries.

The situation in England, which has been and still is the principal market for Port,[9] is an especially trying one. Middle class

[8] Statistics of the Observatório Central Meteorológico, Lisbon, show that west winds are three times more frequent than any other wind in the Douro region in the period from April to October. East winds have a like preponderance in the winter months.

[9] The 1935 exports were divided in the following percentages:

England	48.2 %
France	28.0
Norway, Sweden, Denmark	9.8
Belgium and Holland	5.25
Germany	2.25
Brazil	1.1
United States	0.7
Other countries	4.8

families which used to keep cellars well stocked with the best Ports now are constrained to buying seldom and poorly, partly because they now live in cellarless apartments, and more because they no longer have the means to buy with. Coupled with this has been an inducement to buy "Empire" wines, because the agreements of a few years ago accorded them even more favorable treatment on the English market than the Portuguese had. Port firms at the moment are struggling against odds in England, where the last few years have seen a notable diminution of comsumption.[10]

France, one of the great wine producers in the world, paradoxically has been the second consumer of Port. But in France there is even less room for hope than in England. Port wines now enter France by quarterly quotas, which promise to be lessened rather than augmented. Frenchmen now find an increasingly large range of aperitifs which use national wines, not Port as a base. As the adjustment to internal supply becomes more perfect Port wine will be more excluded.[11]

Brazil, which has an important Portuguese population, and consequently is a market for a surprising number of Portuguese products, used to consume a large amount of Port prepared as quinquina and vermouth. It was once the third best customer Portugal had for its wines. Now, however, the necessity of bargaining for trade has also introduced the quota idea, and Port finds competitors in wines like French Burgundy. Brazilian imports have declined strikingly in the past few years, and shippers seem pessimistic about retrieving their lost trade.[12]

Just as great have been the declines in the German market, where Port was one of the first things for which "ersatz" could be found, and in other quarters, if there is less room for pessimism, there is little more for hope. The Scandinavian countries and the Netherlands now operate on strict quota bases, and the miscellaneous markets were long ago developed to their peaks.

Of the sales in miscellaneous markets about three-fourths are made in the tropical regions, where strong wine finds favor among those who consider alcohol an antidote for the lassitude occasioned by monotonous heat. The sales are in small quantities and among a widely scattered clientèle, but they contribute an appreciable increment to the trade, and promise to continue constant as long as

[10] British import, 1929: 27,765,300 litres; 1935, 18,477,614 litres

[11] French import, 1932: 16,886,930 litres; 1935: 10,714,969 litres

[12] Brazilian import, 1929: 1,989,080 litres; 1935: 373,295 litres

white people remain in the equatorial lands. The English and Portuguese colonies, where the people have a tradition for the wine, are the most important of this group of buyers.

Portugal itself does not figure noticeably in the list of consumers of Port. Of the 38,000,000 litres sold annually it is estimated that about 700,000 (1.8%) are taken in Portugal. Not only is the country so flooded with wine that the small amount of Port produced is scarcely noticeable, but it is much too poor to buy the carefully prepared product that finds a market on the outside. The nearest that the average Portuguese comes to tasting Port is in drinking the aguardente that is prepared from the remains of the grapes already pressed to make wine. Until the price of Port approaches that of other local wines Portugal will be the poorest customer for its own product.

The future thus promises neither growth for the firms which trade in Port nor great prosperity for the region which depends on their organization. One can see small hope for the expansion of the present output because any increase in the present insignificant trade to our own country[13] will be amply compensated for by losses in other countries. There is little chance that the present poor standard of living will rise, or that the area of vine cultivation will appreciably increase. A gradual diminution of vineyard acreage is more likely—resulting not only from economic pressure but from an avowed policy of discouragement by the Portuguese government, which has undertaken to regulate the amount and the quality of the wine produced. The overproduction problem momentarily has been solved by the Casa do Douro, the supervising body, by arbitrarily limiting the amount of must that can be treated as Port. In 1934 and 1935 27,500,000 litres were treated each year. When one compares this with the exportation, which totalled approximately 38,000,000 litres each year, he sees that stock depletions promise better prices in the future, and somewhat higher profits to those who are fortunate enough to remain.

Higher prices must not be interpreted as meaning prosperity for the Douro, for two-fifths of the former producers of Port have been excluded from the sale of their wines by the arbitrary limitation,[14] but they still remain in the region. The fortunate few whose quintas remain Port quintas will improve their positions, but the now more numerous producers of aguardente and Douro Claret will be worse off than before. No amount of limitation can improve the status of the group as a whole. The Port industry is somewhere between a static and a declining state.

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[13] Import into the United States, 1935: 252,736 litres

[14] Total production in 1929: 45,000,000 litres approximately

A MAJOR INDUSTRY IN PORTUGAL

Even if its position is declining relatively, the manufacture and export of Port wine remains one of the most important activities in Portugal. It is one of the country's most valuable manufactures, and it furnishes easily the largest export from a nation which has difficulty in maintaining its trade balance. Sardines and cork help to pay for the imports of dried cod that Portugal eats, the cloth that it wears, and the coal that it burns, but Port bears by far the greatest part of the burden of making exports and imports balance.[15] Portugal introduced itself centuries ago into the European trade world with Port, and its problem at the very moment seems to be that of keeping its imports down to what Port can pay for.

Port's influence has not ceased with its simple addition to the trade balance sheets. Its indirect effects upon the economic life of the country have been no less striking than its preponderance in the export trade. Foreign capital was first enticed into Portugal for the development of the wine industry, because Portugal had little of its own, but once comfortably settled there its spread into other branches of Portuguese commercial activity was inevitable. Thus one finds English, French, and Belgian investment in every corner of the Portuguese economic structure. From its beginnings in the wine trade foreign money found out cork and resin, it developed mines, built factories and railways, and installed every public utility in Portugal. Outside capital undoubtedly would have discovered Portugal without Port's introduction, but the process of development would have been considerably delayed in this remote country of little indigenous resource.

More evident and more impressive is Port's influence upon the life of Northern Portugal. Porto, little before the wine trade began, is now one of two cities in the country. The shallow harbor of the Douro estuary and the treacherous sand bar which guards its mouth

[15] Exports from Portugal, by value, 1933:

Wine	$8,641,575.00
Fish	5,569,875.00
Cork	3,823,830.00
Cotton Goods	2,113,695.00
Fruits	1,725,435.00

Statesman's Yearbook, 1935

were designed not to attract ships, but to keep them away—as indeed they did until it was found that Porto harbor was the most convenient point for loading the sought for wine. The city's future was determined from the time that the first casks of Port left it, for it was assured a monopoly on the export of Douro wines by its position at the mouth of the river. Its activity was not limited to a regulation of the wine trade, however, because as the point of loading Port it became also a place for unloading ships' return cargoes. Porto, the former fishing village and ferry landing, became an entrepôt. Not only were barrels and other articles needed by the wine firms landed there, but increasing quantities of English textiles manufactured metals, machinery, and coal. O Porto was indeed "the port" for northern and central Portugal.

In time suggestion prompted the establishment of factories to turn out some of the articles which hitherto had formed the return cargoes. Portuguese cooperages now turn out the formerly imported barrels, as one certainly would expect, but factories for textiles and metal goods, inspired by the imported patterns and aided by the incoming fuel, have been started and are expanding in the vicinity of Porto. Importing houses found the establishment of Portuguese factories only a logical step, and goods are now being manufactured which might have been introduced only recently had it not been for Port.

One can follow the influence of the wine exporting industry upon Portuguese economic life further and onto more controversial ground. There is no need of that, however, to convince one that Port has made significant contributions to the national wealth of its homeland, and that it has kept it in contact with the world. Portugal in some measure may be consoled for its striking lack of the resources upon which modern civilization is founded, by its possession of the spot of soil and climate which produces its famous wine. It is very fitting that "Port" commences the name "Portugal."

AN APPROACH TO MAP STUDY

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"Can geography be taught as part of social studies?" This is a question often raised. Perhaps a report of how one group began to learn about maps will be a help in answering it.

It is the responsibility of the lower grades to see to it that children's original exposure to maps is so real and clearly understood that work with them afterwards will be a pleasure. Our work in social studies, centering around a study of our own community, offered an excellent opportunity for a beginning in this study. This was third grade, so few of the children had yet taken any interest in maps, tho a few knew something about automobile road maps.

Since the children came from all sections of the city and suburbs we began by trying to locate their homes in relation to the school. With chalk on the classroom floor the children started a very simple map. They drew the streets around the school and a few of the main streets leading down town and to the suburbs. From clay they made tiny models of their own homes, painted them, and using these main streets as guides, placed their homes about where they thought they belonged. This took many days as most of the children were brought to school in cars and had not noticed what streets they took, or in what directions they had driven. Many children had to be reminded day after day to notice street signs and right or left hand turns before they could finally trace the route with a tiny toy car on the map, and place their homes correctly. Since this was all quite new, we made directions on the map correspond with actual directions.

Finding out more about our community led to several trips. The first of these was to a near-by lighthouse, from the top of which we had an excellent view of the harbor, coast line and vicinity of our school. Several additions to the floor map were made as a result of that trip and others to such places as post office and fire station. As experience in noticing streets grew, the children realized they would need to make several changes in their map; buildings had to be moved, streets erased and put in better relationship. By this time they had covered the chalk lines with white poster paint so that the buildings could be picked up every night and the floor swept without having the lines destroyed, but even these lines were readily washed off if changes were necessary.

For several weeks the work carried on in this way, with all streets going on by guesswork,—this building was about here, that street about there. Only when, inevitably, arguments arose as to the placing of things, did it seem wise to begin to discuss scale. Several of our group walked to school from North Avenue and knew that it is a mile, so we measured that distance and found that we were using two feet to a mile. The next point was to see how nearly the rest of the map fitted that scale. To check on this we planned together a trip down town and around a large square back to school, about ten miles in all. Each child took a pencil and a paper telling what distances we wanted to measure, and in groups of four or five to a car with fathers and mothers acting as chauffeurs, we set out. At each of the main streets that we had on our map the cars stopped while the driver helped the children figure out from the speedometer how far they had been since the previous stop. Back at school again the class enjoyed checking on their map and erasing when necessary. Surprisingly few changes had to be made, but now there was no need to argue. It was fixed to everyone's satisfaction. After that the children measured distances whenever they went on an excursion so that new streets and buildings could be accurately placed.

Later one of the children complained because his home was so far away it couldn't be placed on the map, and he did wish we could make one on a smaller scale so there would be room for it. A group decided to try it in another part of the room using only one foot to a mile. They found it was quite a simple thing to do. This time it was drawn on brown wrapping paper and for the first time we discussed directions. One child knew that we needed a "thing like a compass" pointing North, so he drew it in the corner of the map, using a real compass as guide. Then we picked the paper up and turned it different ways, finding that with this sign as a guide it could be turned any way and still be accurate. It was called to their attention, that altho North is usually at the top of a map, it is not always so, and one needs to look for the compass sign.

Everything so far had been group work, and only after this much had been accomplished did we try individual maps. Each child then decided what scale he would use for his own map, most of them choosing one or two inches to a mile. By this time they were so familiar with the distances they had measured on their trips that there were very few who needed any help. Many children went ahead putting in more streets than we had used on the floor map. Then *for the first time* the group was shown a map of the entire city.

Reading it then was easy, and fun, too. By this time the idea of scale had sufficient meaning for them so that measuring on any map was not too difficult. In fact, finding distances between places on the big wall maps became a popular pastime.

It should be made clear that all this map work covered a period of many weeks during which the class was finding out much more about the community than just how the streets lie. The slow growth of the big map during our visits to dairy, ice cream factory, pumping station, etc., was the factor that made it real to the children. They were never told where to put a street or building, or corrected except by each other if mistakes were made. It all grew from first hand experiences. Toy cars and trains on the map made it an interesting play center and much of the learning of streets and directions was incidental to this play. The entire experience proved to be a satisfactory way of helping children to understand maps, and of emphasizing the geography side of the social studies program.

A HUNDRED YEARS AGO GEOGRAPHY WAS TAUGHT "EVEN TO FEMALES"

The following amusing paragraph is from the introduction to "A Modern Atlas," by John Pinkerton, published in 1818: "Geography is a study so universally instructive and pleasing that it has, for nearly a century, been taught even to females, whose pursuits are foreign from serious researches. In the trivial conversations of the social circle, in the daily avidity of the occurrences of the times, pregnant indeed above all others with rapid and important changes, that affect the very existence of states and empires, geography has become an habitual resource to the elegant female, as well as the proud philosopher."

CONSERVATION IN UTAH, A SEMI-ARID REGION

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Nationwide attention has been called to the lack of conservation in our semi-arid regions. From time to time suggestions have been made as to the proper use of these areas of light, unreliable rainfall, but it has taken disastrous floods, great dust storms, wide destruction of fertile lands and large-scale movements of people from these regions to bring a realization that their use should differ from that of more humid areas, and that solutions to their problems also will differ materially.

Our semi-arid lands may roughly be located as lying west of the 100th meridian. Not only all of the Great Plains are a part of this vast semi-arid domain but much of the Colorado Plateau and the Great Basin are also included. The state of Utah has an average rainfall of about twelve inches, and at least half of the state may be classified as semi-arid (Fig. 1).

Conservation carries a different meaning in various parts of the country. A resident of the South thinks of land drainage, flood prevention, and soil erosion work. In the north-central states it probably is definitely associated with the reclamation of cut-over lands; on the plains, with restoration of plant cover. In the semi-arid regions of the Great Basin, the term means saving and increasing the water supply.

Bernard De Voto has said of the West, "in the end as in the beginning, a dry land so that all problems returned to the master problem of how to get enough water on land for which there could never be water enough."

INCREASING THE AVAILABLE SUPPLY OF WATER

Water, there, is the greatest natural resource. Only in the mountains, otherwise unsuited to agriculture, is the rainfall sufficient for crop production. Elsewhere, agriculture is entirely dependent upon special farm practices, such as irrigation and dry-farming and even these methods of farming are entirely dependent upon the water supply. Of vital importance, then, are measures which deal with the efficient use of the present water supply or plan to increase the amount available.

The proposed increase in amount of available water will not directly conflict with the Government's attempt to limit crop production. Some will be used to maintain municipal supplies, some to stabilize power production and some to furnish supplementary water to land now receiving insufficient amounts or to lands without water, lying within irrigated districts.

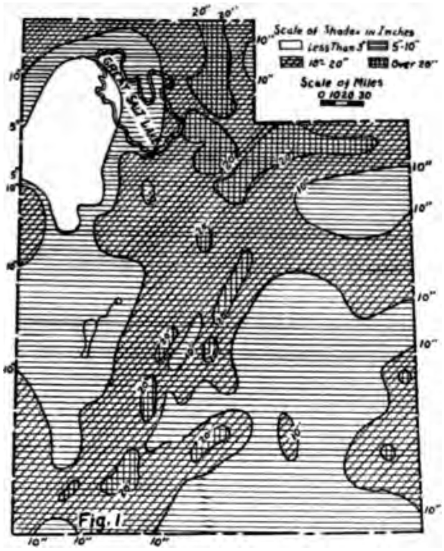
There are several ways in which this supply may be increased, among which are the following proposed plans.

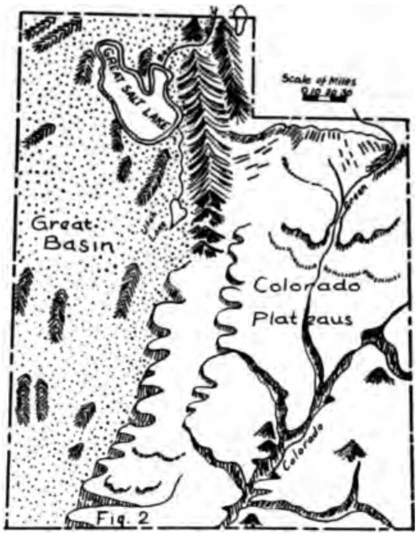
1. Better Methods of Irrigation. The unprecedented water shortages during the last few years have resulted in improved methods of using water and greater cooperation among users. As early as February, 1934, it was recognized that Utah was facing a very serious drought. Largely as a result of excellent cooperation among the water-users, in many areas of the state, normal or nearly normal crops were produced that year, and in other areas considerable forage was raised.

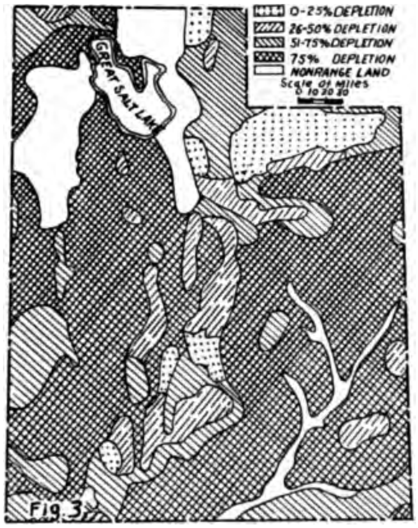
Some irrigation methods which conserve moisture are: (1) storing all water and postponing irrigation until moisture requirements of the soil demand it; or if storage facilities are not available, practicing early spring irrigation and filling the soil to its maximum capacity, thus using the soil as a reservoir; (2) running the early flood waters over the gravel-beds above the ground-water basins in those regions where pumping is practiced; (3) removing weeds and cleaning ditches and canals early in the spring in order to prevent undue loss from seepage; (4) rotating the use of the stream and having a shorter irrigating period rather than using a divided flow a longer time; (5) planning a cropping system that fits the probable available water supply in regard, both to amount of water and time available, thus avoiding the planting of late crops when late season water is not available.

2. Diking Utah Lake. This plan for conserving available water is unique in that it proposes to reduce the capacity and area of an existing reservoir in order to increase its annual yield.

Utah Lake, a small fresh-water lake in the central part of the state, has been compared to a huge shallow evaporation dish. Water evaporates from the lake at an average of nearly 4 feet a year. In years of low run-off as much as 75 per cent of the total inflow to the lake is lost by evaporation, leaving only 25 per cent available to canals which divert water from the lake. In order to reduce the large evaporation losses a dike 5½ miles long is to be built cutting off the southern arm of the lake. The water saved will provide an additional water supply for about 50,000 acres of land already under irrigation in Salt Lake County.







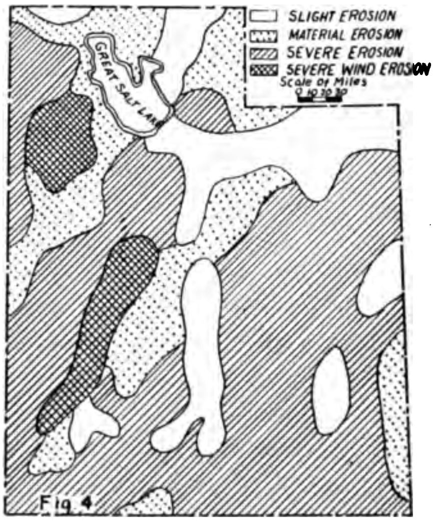


Fig. 1. Rainfall map. From map by U. S. Weather Bureau

Fig. 2. The Two Drainage Basins in Utah. (After Physiographic Diagram by A. K. Lobeck.)

Fig. 3. Forage Depletion on the Present Range. Courtesy, U. S. Forest Service

Fig. 4. Erosion on Utah Range Lands. Courtesy, U. S. Forest Service

3. Diking Great Salt Lake. In order to secure an adequate supply of water for industrial use and perhaps add a supplementary supply for irrigation it has been suggested that a dike be built across Great Salt Lake changing part of the lake into a large fresh-water reservoir.

Two plans for such work have been presented. The larger project contemplates the building of dikes about 12½ miles in length, connecting the southern shore, two large islands, and Promontory Point, isolating about 430 square miles of water which would be freshened in a period of about five years by water from Bear River and the Wasatch Mountains. The smaller project would barricade only the southeast portion of the lake, comprising approximately 146 square miles, and divert to it the flow from Weber River. In either case the water in the reservoir would be maintained at a slightly higher level than in the salt lake and the heavier salt water, probably aided by pumps, would pass thru submerged gates into this lake.

Because the water supply in Great Salt Lake is insufficient at present to supply evaporation and to keep such a lake filled, this plan has not been carried out.

4. Diverting Water from the Colorado River Basin. The state of Utah is naturally divided into two almost equal areas, the Great Basin at the west, and the Colorado Plateau System on the east (Fig. 2). The narrow fertile strip lying just west of the Wasatch Mountains and Plateau Escarpment contains the larger part of the irrigated area of the state and most of the people, but has a limited water supply. The Plateau area of higher elevation and broken relief, crossed by deeply-intrenched streams tributary to the Colorado River, has a small population but ample water supplies. Therefore, it would seem advantageous, if possible, to divert this unused water from the Colorado River drainage basin into streams which would carry it to the more densely populated oasis west of the mountains. This would occasion no conflict with the Colorado River Compact, where 7½ million acre-feet of water were allocated to the four upper states, New Mexico, Colorado, Wyoming, and Utah. If Utah is to use any considerable portion of Colorado River water, it must be thru diverting it from the Green River drainage.

Such a diversion is made already by the Strawberry River Development, where water from the headwaters of this river, tributary to the Colorado, is carried under the mountains thru a tunnel over 3½ miles long and turned into the Provo River which finally reaches the densely populated oasis. It is now proposed to build a second tunnel 5½ miles long to divert water from the North Fork of the Duchesne River into the Provo River.

Another proposed diversion of Colorado Drainage water has been suggested as feasible in Wyoming, where water from the Green River would be diverted into the Bear River which furnishes water for irrigation in the three states of Wyoming, Idaho, and Utah. Lands along this river have been brought to a high state of cultivation producing, in addition to alfalfa and hay, such specialized crops as sugar beets, peas, potatoes and fruit.

Other proposals for diversion from one basin to another have been made and one such project, now nearing completion, carries water thru a tunnel under the Wasatch Plateau from the Price River basin for use in central Utah.

5. Regulating Use of Underground Water. Prior to 1935 there was little regulation of underground water, which furnishes an appreciable supply of domestic, irrigation, and municipal water in the state. No attempt was made to limit the number of wells drilled, even when the supply of water was over appropriated and the drilling of new wells interfered with the flow from old wells. Considerable litigation resulted. With this lack of regulation the flow of most wells has decreased and hundreds require pumping or have entirely ceased to flow. In some instances entire groups of small artesian wells which were used chiefly for culinary and stock-watering purposes have gone dry because large wells pumped for irrigation purposes have recently been sunk in the area.

In an effort to remedy this situation the 1935 legislature enacted an amendment to replace the present water law stating that "all waters of the state whether above or under the ground are declared the property of the public and subject to all existing rights to the use thereof." This law made ground water in Utah subject to the same laws of appropriation, distribution, and adjudication as surface waters, with regulation of their use vested in the State.

6. Forecasting the Water Supply by Snow Surveys. In order to be able to determine the amount of water which probably will be available for the succeeding irrigation season, snow-survey work on the higher lands of the western states should be carried on during the winter months.

It has been estimated that on the high watersheds of Utah from 60 to 90 per cent of the total precipitation falls as snow which accumulates during the winter months and furnishes the run-off during the period of low precipitation in summer. Approximately 80 per cent of the stream flow comes from about 20 per cent of the area of the state which lies at an elevation of 7,000 feet or more.

The late summer flow, upon which depends the amount of land which can be irrigated, is most valuable. Fifty snow courses have been laid out by the Agricultural College Experiment Station and measurements made about the first of April each year form the basis for forecasts. Such forecasts at the beginning of a season are of untold value. Farmers, stockmen, municipalities, water companies, power plants, etc., can plan for the summer. When advance knowledge of a threatened water shortage is available, plans for storage or conservation can be made, and supplemental supplies may be developed.

7. Controlling Small Streams. The importance to the physical well-being of the people of the United States of the proper treatment and use of headwater and other small streams is only just beginning to be recognized. Remedial measures should plan for conservation work where the rain strikes the ground, at the source of the rivers.

Small streams in a semi-arid region gather the precipitation from the higher watersheds and carry it to the more arid but fertile farm lands in the valleys below. Most of the streams are small, relatively short, with steep gradients and little room for run-off storage. These streams are snow-fed and during their peak flow which occurs during May and June they carry from 5 to 25 times as much water as during their low-water flow from July to September. Water from these small streams is used for irrigation, power, and municipalities. The entire low-water flow is utilized but frequently the spring high water is wasted.

Storage reservoirs, stabilizing and protective structures are offered by upstream engineering to mechanically control these small streams so that the natural flow is equalized, the soils on the watersheds are stabilized, and protection is given against floods along stream channels. Where sites are available storage reservoirs very effectively equalize stream flow. Investigations for the purpose of finding such sites in Utah have recommended 88 as feasible sites. Cost estimates have been made and work has started on some of them.

RESTORATION OF WESTERN RANGE LANDS

Second in importance only to the necessity of conserving water is the need for the conservation and wise use of range lands. The western range has never been recognized as one of the great natural resources of the country. Not only its value but the consequences of neglect and abuse of these lands have been quite overlooked.

Range depletion (reduction in grazing capacity) for the entire area of range land in the United States averages over 50 per cent, being greatest on the public domain, and least on the national forests.

In June, 1934, the Taylor Grazing Act went into operation "to stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range and for other purposes." About one-half of the public domain (or some 80 million acres of range lands) was placed in grazing districts which are being supervised by the Department of the Interior. An amendment to the bill, now pending, contemplates the inclusion of an additional 63 million acres.

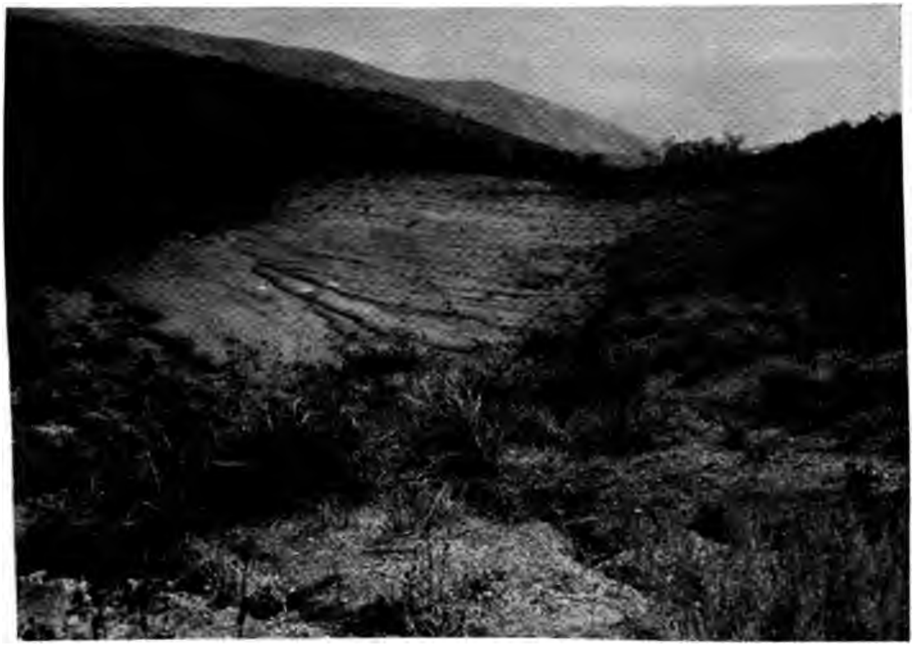


Fig. 5. Eroded area near the headwaters of a small stream. (Parrish Creek.) Overgrazing of this area resulted in floods at the mouth of the canyon. Courtesy, U. S. Forest Service.

With the exception of a small amount of land located west of Great Salt Lake, all public domain of Utah (nearly one-half the total land area of the state) has been placed in nine grazing districts. Range lands of the state with 50 to 75 per cent depletion are severely eroded (Fig. 3). The Drouth Range Administration has already spent some $310,000 developing spring water and has sunk 48 wells in the western part of the state. As yet no reseeding of ranges has been carried on, but CCC workers are building trails and fencing lands. Cattle are confined to certain areas, but sheep, because they have a herder, are allowed to spread out, in some places going into two or three districts.

Control of the western range will eventually result in restoration of ranges to their previous carrying capacity. It is estimated, however, it will take 50 years to make the range capable of carrying the 17.3 million livestock units now found there and another 50 years to render it capable of supporting its original capacity of 22.5 million units.

CHECKING ACCELERATED EROSION

Not only has overgrazing depleted the resources of the western range but this destruction of the vegetative cover has resulted in severe erosion and destructive mud flows (Fig. 4). Available data have shown that the most important factor in affecting erosion and run-off is not slope, but the character of the vegetative cover and soil. Adequate proof is available to show that small overgrazed areas in the high watersheds have caused floods which destroyed farm lands and buildings in several parts of the state (Fig. 5). Experiments carried on by the Forest Service show the beneficial results of proper grazing or temporary non-grazing of areas.

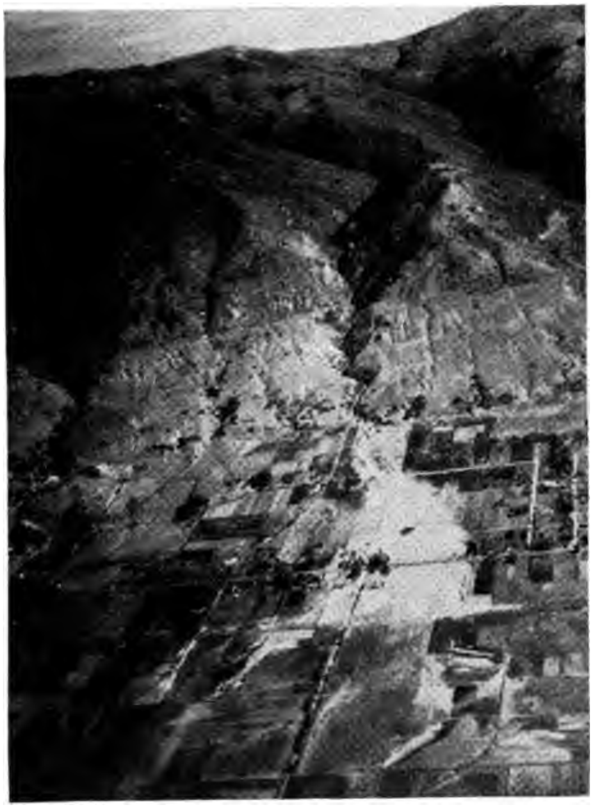


Fig. 6. Farm lands devastated by mud-rock flows. (Parrish Creek north of Salt Lake City.) Courtesy, U. S. Forest Service.

The steep mountain streams of the Rocky Mountains present a peculiar problem for control. In recent years during heavy summer storms many of the mountain streams of northern Utah have been subject to disastrous mud-rock flows which carry sand, gravel and huge boulders, from the narrow canyons out on the alluvial fans in the valleys, filling ditches, burying roads, fences, and fertile fields, and destroying buildings (Fig. 6). It is the great load of debris rather than the large amount of water which makes the control of such flows difficult. To check such a flood, barriers or dikes are built across the stream to spread the water as it emerges from the canyon, a spillway is constructed to take care of the surplus water and a stilling pond is placed lower down where the finer material may settle.

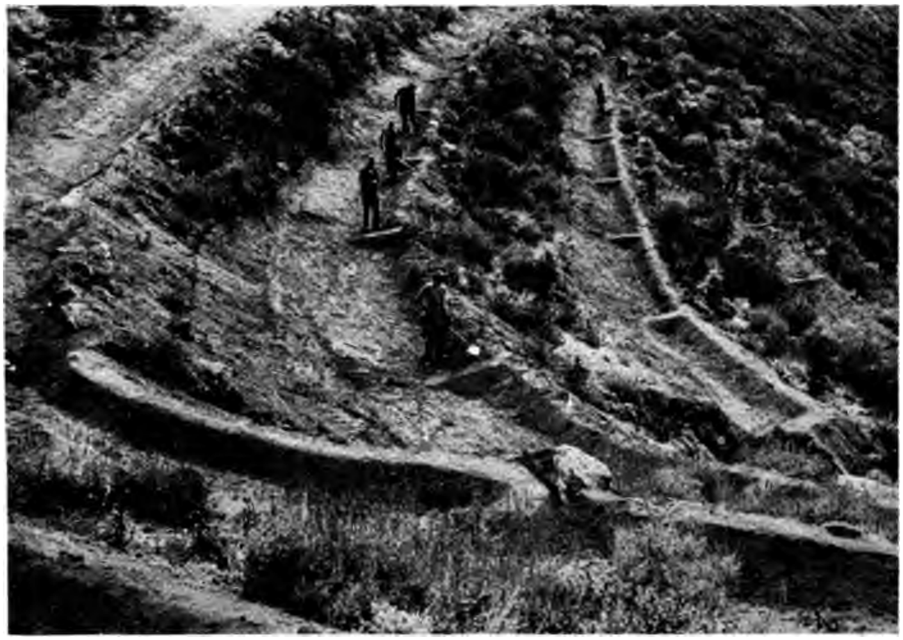


Fig. 7. A series of terrace-trenches. Courtesy, U. S. Forest Service

Such measures should be regarded as temporary remedies only. Each storm carries debris into the basins so that the walls must constantly be built higher or the basins cleaned out between storms. Permanent control of such small streams in semi-arid regions is dependent upon revegetation of eroded areas in the high watersheds.

Where serious erosion is taking place on steep slopes, trench terraces, which serve as small reservoirs, are built, thus delaying run-off, preventing floods and aiding in soil stabilization and revegetation (Fig. 7). A series of contour trenches ascending the steep slopes in a series of steps are constructed about 25 feet apart. When completed they are seeded to grasses and weeds, and trees are set out at regular intervals. These terrace-trenches are considered the most effective means of controlling run-off and erosion of the headwaters of steep mountain watersheds.

One of the largest conservation projects now carried on by the Federal Government is the rehabilitation of the Navajo Indian Reservation. These high plateau lands of southeastern Utah, northeastern Arizona and northwestern New Mexico support a growing population which now numbers about 45,000 Indians. Overgrazing has resulted in accelerated erosion which has washed away fertile fields, and lowered the water table. To prevent the concentration of water in the larger streams, diversion dams and spreading works have been built and on the headwaters upstream engineering devices such as check dams, gully plugs and terrace-barriers.

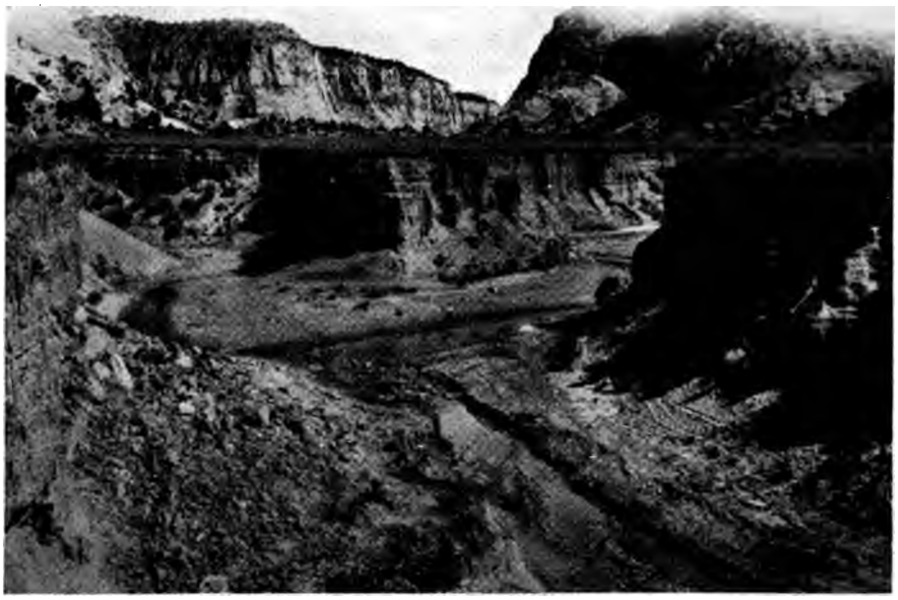


Fig. 8. Accelerated erosion in one of the valleys of the Colorado Plateau. (Kanab Creek, southern Utah.) Courtesy, U. S. Forest Service.

Accelerated erosion is rapidly carrying to the sea, fertile farms in other parts of the Colorado Drainage Basin (Fig. 8). Alluvial deposits laid down when streams were aggrading have been deeply cut or entirely scoured out. The seriousness of the situation is shown by the decline of Bluff, Utah, located on the San Juan River. This town, once said to have the greatest per capita wealth of any town in the United States, has been reduced from a prosperous town of 600 to a tax-delinquent community of 50 persons. Overgrazing has reduced the carrying capacity of the range and the river has carried away one-half the agricultural lands.

These fertile farms formed part of the greatly increased load of silt carried by the Colorado River to harass engineers at Boulder Dam and to form a problem of interest to Los Angeles water-users. Elwood Meade in speaking of the Colorado has aptly described the river when he said, "It is too thick to drink and too thin to plow."

PURCHASE OF SUB-MARGINAL LANDS

In the intermountain area some of the finest range lands were plowed for dry-farms. Part of this land was entirely unsuited to cropping, and many of the dry-farmers are now on county relief rolls. In order to relieve their distress, remove the menace of dust storms and floods, and finally to return this sub-marginal dry-farm land to range use for which it is best suited, the Federal Government is buying this land or exchanging for it more desirable farm lands elsewhere.

The rehabilitation of these lands will be painfully slow. Shantz estimated that it required from 20 to 50 years for short grass to be reestablished in eastern Colorado and that in some areas it might require 100 years for the return of the native vegetation. After land has been plowed in Utah it is covered with weeds such as Russian thistle, mustard, sunflowers and niggerhead. Later, sagebrush returns and, still later, the more nutritious bunch grasses, weeds, and browse plants. Artificial reseeding sometimes helps but is expensive and usually less satisfactory than natural revegetation. However, it is absolutely necessary that some plant covering is developed, no matter what it is.

There are two Resettlement Administration Land Purchase Projects in Utah. In both regions dry-farming has been tried but their scant average rainfall of only 11 inches is usually not sufficient for profitable dry-farming in Utah.

The Widtsoe Land Use Adjustment Project comprises some 30,000 acres in Garfield County in the southcentral part of the state. The short growing season (the elevation is over 7000 feet), and long distance from market make it an area unadapted to crop production. It is best suited for grazing, but the farm units of 320 acres are so small that cattle raising is not profitable. The land is to be removed from cultivation and added to the Powell National Forest as a grazing subdivision. This will reduce the fire hazard in the forest, permit the raising of supplementary winter feed for livestock, prevent floods which occur during the period of high water, and provide a much needed lambing-ground and valuable grazing lands.

The Central Utah Dry-Land Agricultural Project comprises about 40,000 acres of land in a small valley at the south end of Utah Lake. In addition to insufficient rainfall the problem here is that of a light sandy soil too poor, or too run-down, to support dry-farming. It is intended to return this crop-land to grazing use also, in order to make the land productive again and to remove from the surrounding region the menace of periodic dust storms. The two projects will effect the removal of about fifty families.

SELLING CONSERVATION TO THE PUBLIC

All parts of the country face the problem of making people aware of the urgent need for conservation in some form. In Utah, this work has been carried on both by organizations and individuals. Among the former are canal companies, sugar factories, groups of citizens, and the Agricultural College. The Governor of the State, his Drought Committee, and the State Engineer have constantly worked to this end. With a return to more normal rainfall conditions when the need for conservation is not so easily seen, this work may become more difficult but must be continued.

OTHER TYPES OF CONSERVATION

Additional conservation plans propose (1) the protection of wildlife, (2) the establishment of recreational areas, (3) the pursuit of research, (4) reclamation of water logged and alkali lands within irrigated districts, (5) the administration of plans for large areas based on major drainage basins rather than on states, (6) the coördinating of land units so that pattern and size are suited to the type of development of the region.

Many geographic writers such as Semple, Huntington and Hahn have shown the ill effects of man's careless use in the past of his natural resources. Soil erosion is one of the greatest problems facing the country today and unless speedy action is taken the semi-arid region in Utah will become in fact a part of "The Great American Desert."

AN EFFECTIVE PROBLEM METHOD

WILLIAM KESSELMAN
Oklahoma Avenue School, Milwaukee, Wisconsin

For a number of years teachers of geography have been talking about teaching by problems. Thousands of teachers have tried it, but have found that they, and not the child solve the problems. The problem method needs no justification, pedagogical literature is filled with praise of its social implications.

Some of us forget, that the child must be taught to recognize a problem and its elements, before he is given problems to solve.

To teach the child to think of life and geography in terms of problems, the following four steps have been planned:

1. Introduce the child to problems.
2. Give the child the problem and the elements, then help him learn to find the details for its solution.
3. Discuss the material which would raise a problem in the child's mind by the presentation of certain information.
4. Let the children find problems by extensive reading.

Each of the above steps is given a semester. In this article the first part of the plan will be illustrated by the problem, "When we talk about climate, what do we mean?"

Adults like to name the new born child, children like to name the new dog or nickname their friends. Teachers of reading have capitalized on this desire. They have given children stories without titles, and by asking the child to give the story a title, they have been able to motivate better comprehension.

By a method analogous to the one used in reading, the child can slowly be led to the methods of problem solving. The method can best be illustrated by what is done. At the end of this teachers' introduction is a problem which is to be mimeographed or hectographed and distributed.

PRESENTING THE PROBLEM

With the mimeographed material in the hands of the child, the presentation is continued by asking the youngsters to recall, the time when they were very small boys and girls, who toddled along to the grocery store with their mothers. Once among the barrels and boxes, they would ask mother the names of this that and the other thing. Soon they knew something about the grocery store.

A teacher could continue in these words, "Here we have a question or a problem,—When we talk about climate, what do we mean?" Certain facts will solve this problem. One fact is discussed under each number. (See the problem at the end of this article.) Read the paragraph under number one and give it a name, if you can't think of a name the first time you read the paragraph, read it over again. If you still can't think of a name, skip it and go on to the next one. Then after you have completed the others go back to those you have skipped, and you will probably have a name in mind. Let's see who can give the best name."

To care for individual differences such as rate of reading and comprehension, at the end of the problem on climate the following have been placed:

1. What is a cyclone?
2. What does humidity mean, and how do they find out how much there is?
3. Make a rainfall map of the United States.
4. Make a growing season map of the United States.

To do these things the child will make use of the supplementary material and encyclopedias in the classroom.

THE SOLUTION IN ACTION

About thirty minutes gives all children ample time to read and name the work in climate. The teacher then asks for the titles chosen for the first paragraph. (For brevity only one of the titles given by the children will be given here.) The titles are written on the blackboard by the teacher. As each child gives his title, he is asked why he has chosen it. He may quote part of the paragraph. When five or six titles have been listed, the teacher asks the class to choose the title which best fits the paragraph. Here the content of the paragraph is digested and absorbed thru discussion. The spirit of competition is satisfied in the attempt to be the one to have the chosen title. The spirit of cooperation is developed in finding the most fitting name.

Each paragraph or groups of paragraphs is discussed and the title chosen. Let's say the titles chosen are:

1. Growing season
2. Temperature
3. Rainfall
4. Effect of a large body of water
5. Winds change rainfall and temperature
6. How the Weather Bureau helps us

The children can be shown that the above are the six facts which we talk about, when we talk about the climate of a place. These facts are the elements mentioned in the second step of the general plan. The children can readily be shown that the wealth of details surrounding the skeleton facts are necessary for the solution of the problem.*

PROBLEM: WHEN WE TALK ABOUT CLIMATE, WHAT DO WE MEAN?

1

When a farmer knows there will be no more frosts, he can plant his seeds. The kind of seeds he plants will depend upon the number of days in which there will be no frosts. In and around Milwaukee the farmers know that they can plant those things which will ripen in about 160 days. Around the Gulf of Mexico the farmers can plant those things which need about 260 days or less to ripen. In southern Florida and southern California the growers can plant almost anything, because they seldom have frosts, making the growing period there about 365 days. The length of time in which it is possible to grow crops is called the growing season.

2

Besides having a long growing season in Florida, it is always quite warm there. On the New England coast, it is as cold as it is in Milwaukee during the winter and as warm as in the summer. In the Adirondack Mountains it sometimes gets to be 40° below zero. This is because it is so far inland and so much farther north than Florida. So we have some places which are very cold, some not so cold and some very hot. When we tell about how hot or how cold a place is, we tell it by giving the temperature we find there. Therefore in telling about climate we tell about the temperature of the place.

3

If we set out a tin can to catch the rain that fell in Milwaukee every time we had a rainstorm, and melted the snow every time there was a snowstorm, and then measured all this water without losing any by evaporation, we would have a tin can between thirty and forty inches deep. It is important to know the amount of rain which falls in a certain place. We cannot grow rice in the deserts of Arizona, altho it may be warm enough. We could not mine borax in the valley of California, if it rained there, as it would all be washed away in solution. It was the right amount of moisture in the air that kept the cotton fibers soft in Manchester, England, making possible the large textile industry. So it is important to know something about the rainfall for crops and industry.

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* Because it is necessary to use this type of presentation for a period of time, a series of problems like the one which follows will be presented in future editions of the JOURNAL.

4

Places like northern Minnesota sometimes have temperatures as high as 102° in the summer and 50° below zero in the winter. But no places on the coast of Maine or Washington ever have such high temperatures during the summer because the cool winds from the ocean cools the land. During the winter it never gets so cold because the winds from the ocean are warmer than the cold land. Thus the ocean, or any large body of water like Lake Michigan, helps keep the temperature more even the year around. This climate is known as the "Oceanic climate." Milwaukee's climate would be more "oceanic" if the winds blew from the east instead of from the west as they do. Places like northern Minnesota are said to have a "Continental climate."

5

If we were to examine the trees in an open field, we would notice that more branches face the east than the west. If we would watch a weather vane for a number of days, we would soon see that the winds blow from the west or southwest much of the time.

If we examined a rainfall map of the United States, we would find over 60 inches of rainfall from central California to Canada, twice as much as in Milwaukee. The winds which come from the ocean carry a great deal of water. As these winds rise on the mountain slopes, they cool and therefore drop much of their moisture. The mountain slopes are therefore covered with heavy forests. But after the winds have passed over the mountains they are dry, because they again descend and are warmed, and have also lost part of their moisture on the mountain slopes. When winds are warmer they can hold more moisture, therefore, instead of watering the land they dry it. From the Rocky Mountains to the Dakotas, Nebraska, Kansas, Oklahoma and Texas the plateau and the vast plains have little rainfall because of the drying winds. These states have about ten inches or a third to one-fourth that of Milwaukee. Therefore winds are important in the climate of a region.

6

We would like to know if it is going to rain for our Sunday picnic or whether it is going to be colder or warmer so we can go swimming. On Saturday night we look at the paper and we can usually depend on the weather report found in our newspaper. How can the weather man tell us that?

From hundreds of places in the United States, the following facts are sent to about half a dozen main branches of the United States Weather Bureau: 1) The amount of rain which fell, if any; 2) The temperature; 3) The direction of the wind, its speed and the amount of moisture in the air in that place; 4) The condition of the sky; 5) The pressure of the air.

These facts are then put on a map. From this map, people who are trained in telling the weather, send their reports to the newspapers.

The Weather Bureau not only helps us on picnics, but warns vessels at sea about storms, the farmers about frosts, the fliers about storms, and of approaching floods. The Weather Bureau not only saves many human lives, but protects our food supply.

WHAT IS IT?

It has latitude, longitude, and many a bay,
It has oceans and rivers where many fish play.
It has cities and towns and valleys so fair,
With beautiful mountains to climb if you dare.
In some places it's cold, in others it's hot,
And some places where you'd wish you were not.

Now try to guess it for this tale is true,
Do try and see how well you can do.

Margaret Raymond
Seventh Grade

School of Practice,
State Teachers College,
Buffalo, N.Y.

EDITORIAL NOTES AND NEWS

New records are being made with great frequency. At 3:40 P.M., October 24, the New Zealand flyer, Jean Batten, landed at the Lympne airport in England, having accomplished a record flight from Australia in 5 days, 18 hours, and 15 minutes. The previous best record, which was made by H. F. Broadbent in May, 1937, was beaten by 14 hours and 10 minutes. The route of Jean Batten started at Darwin, and lay thru Batavia, Alor Star, Allahabad, Karachi, Basra, Damascus, Naples, and Marseilles to England. Trace this route on your map.

DR. HELEN M. STRONG, of the United States Soil Conservation Service, spoke at the Iowa State Teachers Association, and Iowa State Teachers College in November. Accompanied by Mr. Combs and Mr. John of the Des Moines office of the Survey, she visited the State Teachers College at Mankato, Minnesota, speaking before a large assembly of students. All teachers interested in the problems of conservation should make contact with the district office of the Soil Conservation Service. It is highly probable that some interesting work is being done nearby.

A movement is on foot to create a National Park out of a hundred square miles of natural seashore land in the Cape Hatteras region of North Carolina. Much of this dune country with its unspoiled natural plant and animal life is already government owned. Besides its scenic and natural history value, the area is rich in historical lore associated with Sir Walter Raleigh's unsuccessful colony, as well as the site of the first successful airplane flight, made by the Wright brothers in 1903.

The hide industry of Argentina has solicited the Federal and Provincial Governments to enact legislation restricting, and possibly abolishing, the use of barbed wire fencing for animal enclosures. Rips and tears in hides reduce their value in leather manufactures. The meat-packing plants and veterinarians are also claiming that the health of cattle may be impaired by gashes from barbed wire. If the legislation is passed it will have a serious effect on barbed wire purchases in the United States.

The Press Service of the United States Department of Agriculture estimates that the increase of one thirty-second of an inch in the staple length of cotton which has been attained from 1928 to 1934 has added $8,000,000 to the value of the 1934 cotton crop.

The Geography Section of the Maryland State Teachers Association held its annual meeting in Baltimore, October 29. Dr. J. T. Singewald, Jr. delivered an address on "Cape To Cairo By Automobile." Professor E. Curt Walther, head of the geography department at the State Teachers College, Towson, Maryland, is the chairman of the section.

J. SULLIVAN GIBSON, formerly with the T.V.A., is now the head of the geography department in the Alabama State Teachers College at Livingston. Ernest J. Murphy is the other member of the department. Students in this college take geography during their first two years of work.

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R. H. Whitbeck, Loyal Durand, Jr., and J. Russell Whitaker. **The Working World.** 704 pp. 341 maps and illustrations. American Book Co., New York. $2.20.

"Geography as a separate school subject has been under constant attack for many years. Yet in the same period geography as a school subject has changed greatly."[1]

At the same time, texts for this subject have gone thru a remarkable metamorphosis. *The Working World, an Economic Geography,* is an example of a modern text almost wholly in keeping with the modern idea of geographical education.

Some of the especially good features of this book are: 1) The photographs are good and the method of calling attention to them make them a valuable part of the informational material. 2) The chapter summaries will be of great help to the student. 3) Many of the "Exercises" and "Topics for Further Study" will stimulate research work on the part of ambitious students. 4) As an introduction to a study of economic geography, the section describing the United States—"A Country of Great Diversity"—is without a doubt an excellent feature, since without some knowledge of the natural environment of a region the economic activities cannot be readily understood. Such topics as "Diversity of Climate and Natural Vegetation," "Diversity of Land Surface," "Diversity in Mineral Resources," provide the geographic background for an understanding of the economic life of the United States by regions. 5) The section dealing with economic geography, specifically in the United States, is very thoro. 6) The maps and informational material dealing with foreign countries are outstanding features. 7) In Part X, pages 641 to 657 there is an excellent summary of the chief producing regions and world trade. 8) The authors have given a rather complete list of selected reference books and some excellent maps and tables as the finish of the book. 9) The index, in contrast with that of many books, is really splendid.

Many other books dealing with the United States contain similar glorious descriptions of the country and then, apparently as an afterthought, add something similar to this:

"Although the natural resources of the nation are vast and varied, it is well to remember that they are neither entirely adequate to meet the needs of the nation nor are they inexhaustible. Our nation is largely dependent . . . minerals as antimony, chromite, nickel, and tin; and climatic limitations make it impossible . . . tropical commodities . . . such as rubber, cacao, and bananas." p. 28.

If a part of this had been incorporated in the paragraphs "Great Minerals Resources" and "Agricultural Resources," a more accurate picture would have been imprinted upon the mind of the child who uses the book. In that case the pupil would have the correct idea to "remember" when called upon as in the following:

"It is well to remember, however, that our natural resources are neither entirely adequate to meet the needs of the nation, nor are they inexhaustible." p. 41.

On the whole, however, *The Working World* is worthy of consideration by those seeking an economic geography as a classroom reference book or as a text.

CLARA SYMONDS

Senior High School
Quincy, Ill.

[1] *Social Education,* March 1937, page 166.

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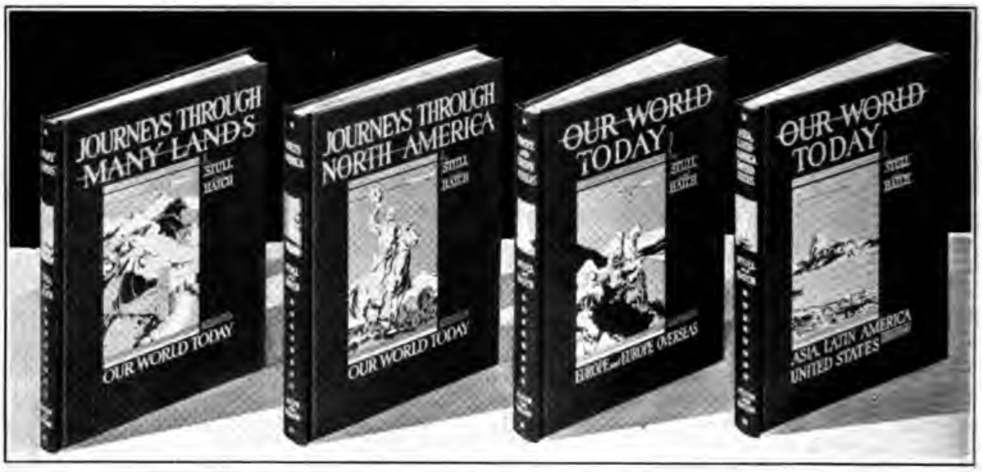
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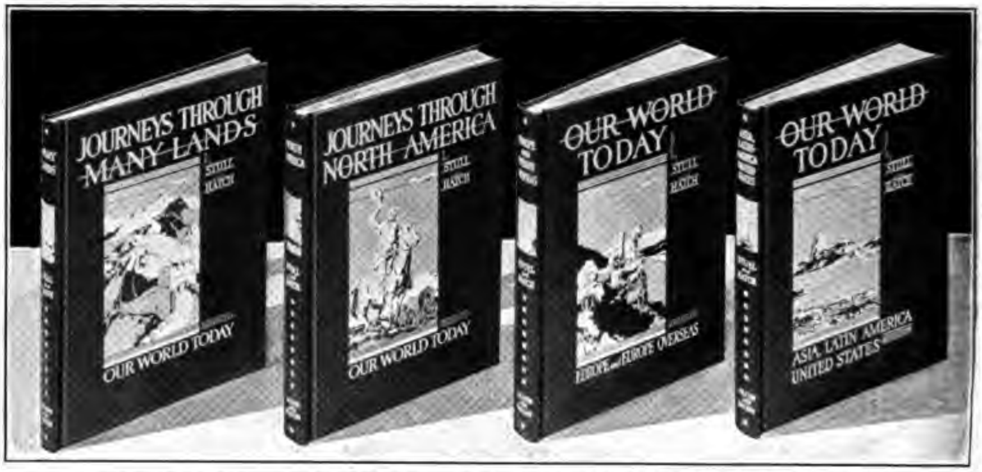
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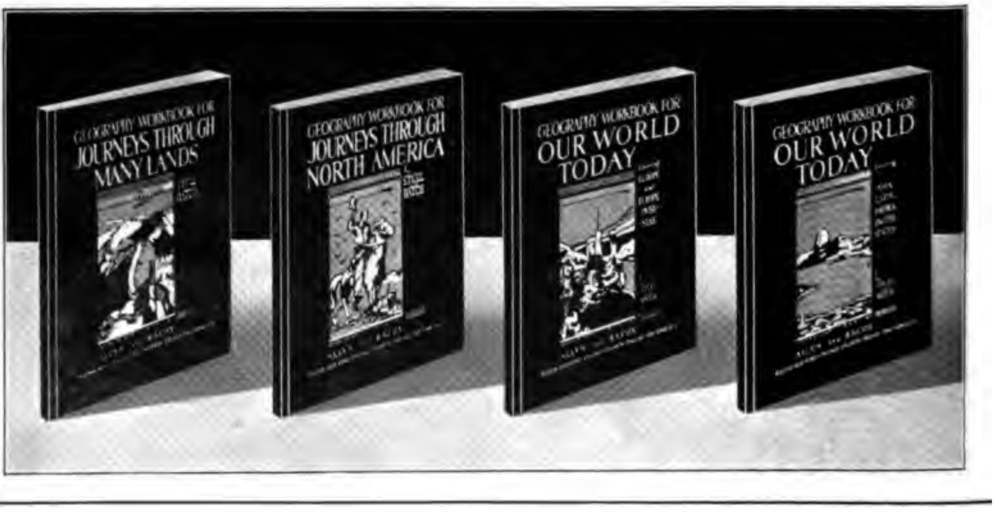
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